Scientific & Technical Information Center
USPTO

STIC Search Report
EIC 3700

STIC Database Tracking Number: 140868

TO: Kurt Fernstrom
Location: RND 6a19
Art Unit: 3714

Case Serial Number: 10/685576

From: Jeanne Horrigan
Location: RND 8A34
Phone: 571-272-3529

jeanne.horrigan@uspto.gov

Search Notes

Attached are the search results for the transducer with different shaped membrane and piezoelectric element.

I tagged the items that seemed most relevant to me, but **I suggest that you review ALL of the results, especially because I did not always understand the abstracts.**

I went ahead with the search using the following assumptions and search strategy. However, if this does not adequately cover what you need, please let me know and I will be happy to do another search on this.

Assumptions:

- I looked for anything dealing with the shapes of membranes and piezoelectric elements in transducers, and looked in the results for differences in their shapes.
- When I got too many results, I narrowed the search to transducers used for sound/acoustic/audio products.
- Although I printed out titles regardless of dates, I limited printing of abstracts and/or key word in context to references published before the priority date of 10/16/03.
- I covered foreign patents as well as non-patent literature, and tagged/highlighted the results.
- I included the results of the mandatory inventor search.

Search Strategy:

- TRANSDUCER? OR LOUDSPEAKER? OR LOUD()SPEAKER? OR MICROPHONE?
- PIEZO OR PIEZOS OR PIEZOELECTRIC? OR PIEZOCERAMIC?
- MEMBRANE? OR FILTER?
- SHAPE? OR EDGE? OR EDGING OR PERIMETER?
- SOUND OR ACOUSTIC? OR AUDIO

Also attached is a search feedback form.

I hope the results are useful. Please let me know if you need another search on this application.

Best regards,

Jeanne Horrigan

Scientific & Technical Information Center
USPTO

STIC Search Results Feedback Form

EIC 3700

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact***:

John Sims, EIC 3700 Team Leader
RND 8B35, Phone 2-3507

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* *Example: 3730*
- *Relevant prior art **found**, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

  Types of relevant prior art found:
  - ☐ Foreign Patent(s)
  - ☐ Non-Patent Literature
    (journal articles, conference proceedings, new product announcements etc.)
- *Relevant prior art **not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/EIC3700 RND 8B31

sira
Search and Information
Resources Administration

Solomon, Terrance

From: Unknown@Unknown.com
Sent: Monday, December 20, 2004 6:32 PM
To: STIC-EIC3700
Subject: Generic form response

ResponseHeader=Commercial Database Search Request

AccessDB#= 140868

LogNumber=

Searcher=

SearcherPhone=

SearcherBranch=

MyDate=Mon Dec 20 18:31:49 EST 2004

submitto=STIC-EIC3700@uspto.gov

Name=Kurt Fernstrom

Empno=75063

Phone=571-272-4422

Artunit=3714

Office=RND 6A19

DEC 21 2004

Serialnum=10/685,576

PatClass=434/113,

Earliest=10/16/03

Format1=paper

Searchtopic=Focus on difffering shapes of piezo-electric element and membrane (see Fig.). Thanks.

Comments=

send=SEND

ASRC Searcher: Jeanne Horrigan
Serial 10/685576
December 28, 2004

```
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200482
File 348:EUROPEAN PATENTS 1978-2004/Dec W02
File 349:PCT FULLTEXT 1979-2002/UB=20041223,UT=20041216
Set     Items   Description
S1         14   AU='MICHIELS H' OR AU='MICHIELS H R' OR AU='MICHIELS HUGO'
             OR AU='MICHIELS HUGO R' OR AU='MICHIELS HUGO REMI C O SONITRON'

1/26,TI/3     (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
013709053
WPI Acc No: 2001-193277/200120
  Thermal and acoustic insulating material, comprises chemically inert,
  incombustible mineral fibers containing silicone, and hydraulic binder

 1/26,TI/4     (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
013100606
WPI Acc No: 2000-272477/200024
  Inductive component e.g. for gas discharge lamp bias circuit, has current
  coil winding with width of winding layers increasing in width in outwards
  direction from innermost winding layer

 1/26,TI/5     (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
013099907
WPI Acc No: 2000-271778/200024
  Composite insulating material for construction is a mixture of inert
  particulate refractory mineral, mineral fibres and hydraulic binder

1/7/1     (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
016271974     **Image available**
WPI Acc No: 2004-429868/200440
  Transducer e.g. loud speaker has membrane composed of two or several
  layers made up of polymer, anisotropic fiber structure or isotropically
  woven synthetic fiber
Patent Assignee: SONITRON NV (SONI-N); MICHIELS H (MICH-I)
Inventor:  MICHIELS H
Number of Countries: 035  Number of Patents: 006
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
US 20040081326  A1   20040429  US 2003685576    A   20031016  200440  B
EP 1422970      A2   20040526  EP 200378135     A   20031003  200440
JP 2004147319   A    20040520  JP 2003353256    A   20031014  200440
KR 2004034489   A    20040428  KR 200372041     A   20031016  200455
BE 1015150      A3   20041005  BE 2002601       A   20021021  200467
CN 1512481      A    20040714  CN 20031102508   A   20031021  200467
Priority Applications (No Type Date): BE 2002601 A 20021021
Patent Details:
Patent No  Kind Lan Pg   Main IPC     Filing Notes
US 20040081326 A1    10 H04R-025/00
EP 1422970    A2 E      H04R-017/00
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   Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
   GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR
JP 2004147319 A     11 H04R-017/00
KR 2004034489 A        H04R-017/08
BE 1015150    A3 F     H04R-000/00
CN 1512481    A        G10H-003/12
Abstract (Basic): US 20040081326 A1
        NOVELTY - The transducer consist of a membrane (2) onto which
    one-piece or multi piece piezo-electric element (4), is provided. The
    membrane is composed of two or several layers (6,7) made up of polymer,
    anisotropic fiber structure or isotropically woven synthetic fiber.
        USE - Transducer e.g. loudspeaker, microphone.
        ADVANTAGE - Achieves improved transducer with unequaled results in
    the field of sound quality. Also reduces the harmful effects caused
    during discarding transducer.
        DESCRIPTION OF DRAWING(S) - The figure shows the schematic view of
    transducer.
        membrane (2)
        flexible glue (3)
        piezo-electric element (4)
        conductor (5)
        multiple layers (6,7)
        pp; 10 DwgNo 1/19
Derwent Class: P86; V06
International Patent Class (Main): G10H-003/12; H04R-000/00; H04R-017/00;
  H04R-017/08; H04R-025/00
International Patent Class (Additional): G10H-005/14; H04R-017/02; H04R-031/00

 1/7/2     (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
014450122     **Image available**
WPI Acc No: 2002-270825/200232
  Transducer for sound-reproduction and/or recording comprises membrane
  comprising material which attenuates sound vibrations
Patent Assignee: SONITRON NV (SONI-N); SONITRON SA (SONI-N)
Inventor:  MICHIELS H R
Number of Countries: 031  Number of Patents: 007
Patent Family:
Patent No      Kind   Date    Applicat No    Kind   Date     Week
EP 1175126      A1  20020123  EP 2001202644   A   20010710  200232  B
US 20020041694  A1  20020411  US 2001901635    A   20010711  200232
BE 1013592      A3  20020402  BE 2000439      A   20000711  200235
CN 1338884      A   20020306  CN 2001125403   A   20010711  200236
JP 2002112389   A   20020412  JP 2001209244   A   20010710  200241
KR 2002006465   A   20020119  KR 200141469    A   20010711  200251
TW 518904       A   20030121  TW 2001119345   A   20010808  200356
Priority Applications (No Type Date): BE 2000439 A 20000711
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
EP 1175126    A1 E  27 H04R-017/00
   Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT
   LI LT LU LV MC MK NL PT RO SE SI TR
US 20020041694 A1       H04R-025/00
BE 1013592    A3 F      H04R-000/00
CN 1338884    A         H04R-017/02
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JP 2002112389 A     59 H04R-017/00
KR 2002006465 A        H04R-017/00
TW 518904     A        H04R-007/00
Abstract (Basic): EP 1175126 A1
        NOVELTY - A transducer consists of:
        (A) a one-piece piezoceramic disk (2); and
        (B) a membrane (3) comprising a material which attenuates sound
    vibrations.
        USE - The transducer is used for sound-reproduction and/or
    recording. It is particularly used as a loudspeaker or a microphone.
        ADVANTAGE - The inventive transducer provides better attenuating
    effect on the sound vibrations generated by the membrane.
        DESCRIPTION OF DRAWING(S) - The figure is a schematic
    representation of the inventive transducer.
        Piezoceramic disk (2)
        Membrane (3)
        pp; 27 DwgNo 7/44
Derwent Class: A85; V06
International Patent Class (Main): H04R-000/00; H04R-007/00; H04R-017/00;
  H04R-017/02; H04R-025/00
International Patent Class (Additional): H04R-001/00; H04R-001/22; H04R-007/04

 1/7/6     (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
012828208     **Image available**
WPI Acc No: 2000-000040/200001
  Miniature sound transducer
Patent Assignee: SONITRON NV (SONI-N)
Inventor:  MICHIELS H
Number of Countries: 001  Number of Patents: 001
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
BE 1011559     A4  19991005  BE 97934        A   19971120  200001  B
Priority Applications (No Type Date): BE 97934 A 19971120
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
BE 1011559    A4 F   24 H04R-000/00
Abstract (Basic): BE 1011559 A4
        NOVELTY - The transducer (1) has a membrane disc (3, 4) with a
    layer of piezoelectric material (5), 30 microns thick. The edges (7) of
    the disc are gripped in a circular clamp (8). The front of the disc is
    coated with a sound damping layer (11). The center and periphery of the
    piezoelectric layer are connected to electric conductors (9, 10). The
    transducer operates at frequencies between 15Hz and 20 kHz.
        USE - Speaker and microphone for personal computer
        ADVANTAGE - Damping layer improves Q factor and lowers resonant
    frequency
        DESCRIPTION OF DRAWING(S) - The drawing shows a cross section view
    through the transducer.
        transducer (1)
        holder (2)
        membrane (3)
        carrier (4)
        piezoelectric element (5)
        electrical connector (6)
```

edge of **membrane** (7)
surround (8)
conductor (9)
conductor (10)
damping layer (11)
metal particles (12)
side of carrier (14)
pp; 24 DwgNo 1/8
Derwent Class: V06
International Patent Class (Main): H04R-000/00

1/7/7 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
012106636 **Image available**
WPI Acc No: 1998-523548/199845

Element for reproducing and/or recording **sound** e.g **piezo**electric **loudspeaker** - comprises wall part situated at short distance from **membrane** so that **sound** vibrations generated by **membrane** are damped

Patent Assignee: SONITRON NV (SONI-N); SONITRON SA (SONI-N)
Inventor: MICHIEL H; MICHIELS H
Number of Countries: 028 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 871345	A1	19981014	EP 98200716	A	19980306	199845	B
JP 10277484	A	19981020	JP 9889894	A	19980402	199901	
CN 1197363	A	19981028	CN 98106159	A	19980402	199911	
BE 1011085	A4	19990406	BE 97309	A	19970403	199922	
KR 98080973	A	19981125	KR 9811423	A	19980401	200005	
TW 370762	A	19990921	TW 98103552	A	19980311	200036	

Priority Applications (No Type Date): BE 97309 A 19970403
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 871345	A1	E	15	H04R-017/00	

Designated States (Regional): AL AT BE CH DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 10277484	A		11	B06B-001/06	
CN 1197363	A			H04R-017/00	
BE 1011085	A4	F		H04R-000/00	
KR 98080973	A			H04R-017/00	
TW 370762	A			H04R-017/00	

Abstract (Basic): EP 871345 A

The element for reproducing and/or recording **sound**, consists of a **membrane** (3) which is equipped with a **piezo**-electric element (5). A electric connecting part (6) works in conjunction with the **piezo**-electric element and a housing (2) is provided for the **membrane**.

The element (1) contains a wall part (17) situated at a short distance (D1) from the **membrane** (3), such that the **sound** vibrations which are generated by the **membrane** are damped.

ADVANTAGE - Provides optimal **sound** reproduction in full range of 15Hz to 20 Hz.

Dwg.1/22

Derwent Class: V06; W04
International Patent Class (Main): B06B-001/06; H04R-000/00; H04R-017/00
International Patent Class (Additional): H04R-001/22

```
 1/7/9     (Item 9 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
003740149
WPI Acc No: 1983-736348/198333
  Electro acoustical converter with closed vibration space - has vibration
  plate with piezoelectric material coupled to acoustical filter to improve
  lower frequency range
Patent Assignee: MICHIELS H R (MICH-I)
Inventor:  MICHIELS H R
Number of Countries: 012  Number of Patents: 002
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
EP 85194       A   19830810                                198333  B
JP 58130699    A   19830804                                198337
Priority Applications (No Type Date): EP 82200060 A 19820119
Cited Patents: DE 3007773; GB 2025734; US 4006371
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
EP 85194     A  G  10
   Designated States (Regional): AT BE CH DE FR GB IT LI LU NL SE
Abstract (Basic): EP 85194 A
        One wall of the closed vibration space is formed of a vibrating
    plate consisting of a metallic disc clamped along its edge. A disc of
    piezo-electric material is fixed on the vibrating plate.
        The vibration plate (TP) is acoustically coupled with an acoustical
    filter (AF). The filter consists of at least two successive chambers
    (K1,K2) which communicate by aperture(s) (O1) in an intermediate wall
    (TW). The first chamber (K1) is separated from the vibration space by
    the vibratory plate. The second chamber (K2) communicates with the
    ambient air through apertures (O2, O3) in the outer wall (BW). The
    acoustical filter ameliorates the acoustical adaptation between the
    vibration space and the ambient air so that there is a nearly flat
    sound intensity/ frequency characteristic in the lower frequency range
    of about 800-4,000Hz.
        1/2
Derwent Class: P86; V06
International Patent Class (Additional): G10K-009/22; H04R-001/22; H04R-017/00

 1/3,AB/10     (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
(c) 2004 European Patent Office. All rts. reserv.
01737519
Transducer of the piezo-electric type
Wandler vom piezo-elektrischen Typ
Transducteur du type piezo-electrique
PATENT ASSIGNEE:
  Sonitron, naamloze Vennootschap, (2477570), Kasteelstraat 93, 9100
    Sint-Niklaas, (BE), (Applicant designated States: all)
INVENTOR:
   Michiels, Hugo , Molenstraat 18, 9180 Moerbeke-Waas, (BE
LEGAL REPRESENTATIVE:
  Donne, Eddy (44722), Bureau M.F.J. Bockstael nv Arenbergstraat 13, 2000
    Antwerpen, (BE)
PATENT (CC, No, Kind, Date):  EP 1422970  A2  040526 (Basic)
APPLICATION (CC, No, Date):   EP 2003078135 031003;
```

PRIORITY (CC, No, Date): BE 200200601 021021
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR; HU; IE; IT; LI; LU; MC; NL; PT; RO; SE; SI; SK; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK
INTERNATIONAL PATENT CLASS: H04R-017/00
ABSTRACT EP 1422970 A2

Improved **transducer** for reproducing and/or recording **sound**, which mainly consists of a **membrane** (2) onto which is provided a one-piece or multipart **piezo**-electric element (4), characterized in that the **membrane** (2) is composed of two or several layers (6-7) of which at least one layer (7) is made of polymer.

ABSTRACT WORD COUNT: 51
NOTE: Figure number on first page: 1
LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200422	383
SPEC A	(English)	200422	1510
Total word count - document A			1893
Total word count - document B			0
Total word count - documents A + B			1893

1/3,AB/11 (Item 2 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
(c) 2004 European Patent Office. All rts. reserv.
01383308
Piezoelectric **transducer**
Piezoelektrischer Wandler
Transducteur **piezo**electrique
PATENT ASSIGNEE:
Sonitron, naamloze Vennootschap, (2477570), Kasteelstraat 93, 9100 Sint-Niklaas, (BE), (Applicant designated States: all)
INVENTOR:
Michiels, Hugo Remi. c/o Sonitron , Kasteeldreef, 93, B- 9100 Sint-Niklaas, (BE
LEGAL REPRESENTATIVE:
Donne, Eddy (44722), Bureau M.F.J. Bockstael nv Arenbergstraat 13, 2000 Antwerpen, (BE)
PATENT (CC, No, Kind, Date): EP 1175126 A1 020123 (Basic)
APPLICATION (CC, No, Date): EP 2001202644 010710;
PRIORITY (CC, No, Date): BE 200000439 000711
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: H04R-017/00; H04R-007/04; H04R-001/22
ABSTRACT EP 1175126 A1

Transducer, consisting of a one-piece or multi-piece **piezo**ceramic disk (2) and a **membrane** (3), characterized in that the **membrane** (3) is realized in a material which attenuates **sound** vibrations.

ABSTRACT WORD COUNT: 30
NOTE: Figure number on first page: 7
LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200204	470
SPEC A	(English)	200204	3757

```
Total word count - document A        4227
Total word count - document B           0
Total word count - documents A + B   4227

 1/3,AB/12     (Item 3 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
(c) 2004 European Patent Office. All rts. reserv.
00960088
Element for reproducing and/or recording sound
Element zur Schallwiedergabe und/oder -aufnahme
Element pour la restitution et/ou pour la prise de son
PATENT ASSIGNEE:
  Sonitron, naamloze Vennootschap, (2477570), Kasteelstraat 93, 9100
    Sint-Niklaas, (BE), (applicant designated states:
    AT;CH;DE;DK;ES;FI;FR;GB;GR;IE;IT;LI;LU;MC;NL;PT;SE)
INVENTOR:
   Michiels, Hugo , Molenstraat 18, 9180 Moerbeke-Waas, (BE
LEGAL REPRESENTATIVE:
  Donne, Eddy (44722), Bureau M.F.J. Bockstael nv Arenbergstraat 13, 2000
    Antwerpen, (BE)
PATENT (CC, No, Kind, Date):  EP 871345  A1  981014 (Basic)
APPLICATION (CC, No, Date):   EP 98200716 980306;
PRIORITY (CC, No, Date): BE 97309 970403
DESIGNATED STATES: AT; CH; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC;
  NL; PT; SE
INTERNATIONAL PATENT CLASS: H04R-017/00
ABSTRACT EP 871345 A1
    Element for reproducing and/or recording sound, consisting of a
  membrane (3) which is equipped with a piezo-electric element (5),
  electric connecting means (6) working in conjunction with the
  piezo-electric element (5) and a housing (2) for the membrane (3),
  characterized in that the element (1) contains a wall part (17) situated
  at a short distance (D1) from the membrane (3), such that the sound
  vibrations which are generated by the membrane (3) are damped.
ABSTRACT WORD COUNT: 75
LANGUAGE (Publication,Procedural,Application): English; English; Dutch
FULLTEXT AVAILABILITY:
Available Text  Language    Update    Word Count
      CLAIMS A  (English)   9842         722
      SPEC A    (English)   9842        4335
Total word count - document A        5057
Total word count - document B           0
Total word count - documents A + B   5057

 1/3,AB/14     (Item 5 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
(c) 2004 European Patent Office. All rts. reserv.
00072839
Electro-acoustical converter.
Elektro-akustischer Wandler.
Transducteur electro-acoustique.
PATENT ASSIGNEE:
  Michiels, Hugo R., Hamstraat 2, B-9170 Waasmunster, (BE), (applicant
    designated states: AT;BE;CH;DE;FR;GB;IT;LI;LU;NL;SE)
INVENTOR:
   Michiels, Hugo R. , Hamstraat 2, B-9170 Waasmunster, (BE
```

LEGAL REPRESENTATIVE:
  Donne, Eddy , M.F.J.Bockstael Arenbergstraat 13, B-2000 Anvers, (BE)
PATENT (CC, No, Kind, Date): EP 85194 A1 830810 (Basic)
APPLICATION (CC, No, Date): EP 82200060 820119;
PRIORITY (CC, No, Date): EP 82200060 820119
DESIGNATED STATES: AT; BE; CH; DE; FR; GB; IT; LI; LU; NL; SE
INTERNATIONAL PATENT CLASS: H04R-001/22; H04R-017/00;
ABSTRACT EP 85194 A1

Electro-**acoustic**al converter.

Electro-**acoustic**al converter with a closed vibration space, one wall of which is formed by a vibrating plate consisting of a metal diaphragm, clamped along its circumferential edge, on which is fixed a disk made of a **piezo**electric material, characterized in that the vibrating plate (TP) is **acoustic**ally coupled with an **acoustic**al filter (AF) which is formed by at least two successive chambers (K(sub 1), K(sub 2)), which are communicating the one with the other through at least one aperture (O(sub 1)) in an intermediate wall (TW), the first (K(sub 1)) of these chambers being separated from the vibration space by this vibrating plate and the second (K(sub 2)) of these chambers communicating with the ambient air through at least one second aperture (O(sub 2),O(sub 3)) in an outer wall(BW).

ABSTRACT WORD COUNT: 134
LANGUAGE (Publication,Procedural,Application): English; English; Dutch

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File 155:MEDLINE(R) 1951-2004/Dec W1
File   2:INSPEC 1969-2004/Dec W2
File  34:SciSearch(R) Cited Ref Sci 1990-2004/Dec W3
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File   5:Biosis Previews(R) 1969-2004/Dec W2
File  73:EMBASE 1974-2004/Dec W2
Set     Items   Description
S1         20   AU='MICHIELS H' OR AU='MICHIELS H.'
S2          3   AU='MICHIELS, H.'
S3         23   S1:S2
S4         15   RD (unique items)
```

```
4/6/4     (Item 4 from file: 155)
04508252    PMID: 1025276
  [Unilateral agenesis of the ear with facial asymmetry and vertebral
anomalies (an incomplete form of oculo-auriculo- vertebral dysplasia)]
  Agenesie unilaterale de l'oreille avec microsomie hemifaciale
heterolaterale  et anomalies vertebrales (a propos de formes incompletes de
la dysplasie oculo-auriculo-vertebrale)
Nov 1976
```

```
 4/6/11     (Item 1 from file: 434)
01369970   Genuine Article#: CV238   Number of References: 24
Title: UNILATERAL AGENESIS OF EAR WITH HETEROLATERAL HEMIFACIAL MICROSOMIA
    AND VERTEBRAL ANOMALIES - INCOMPLETE FORMS OF OCULOAURICULOVERTEBRAL
    DYSPLASIA
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File   2:INSPEC 1969-2004/Dec W2
File   6:NTIS 1964-2004/Dec W1
File   8:Ei Compendex(R) 1970-2004/Dec W2
File  34:SciSearch(R) Cited Ref Sci 1990-2004/Dec W3
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File  65:Inside Conferences 1993-2004/Dec W3
File  94:JICST-EPlus 1985-2004/Nov W2
File  95:TEME-Technology & Management 1989-2004/Jun W1
File  99:Wilson Appl. Sci & Tech Abs 1983-2004/Nov
File 144:Pascal 1973-2004/Dec W1
File  35:Dissertation Abs Online 1861-2004/Dec
Set     Items   Description
S1     235065   TRANSDUCER? ? OR LOUDSPEAKER? ? OR LOUD()SPEAKER? ? OR MIC-
             ROPHONE? ?
S2     163253   PIEZO OR PIEZOS OR PIEZOELECTRIC? OR PIEZOCERAMIC?
S3    2110242   MEMBRANE? ? OR FILTER? ?
S4    1825021   SHAPE? ? OR EDGE? ? OR EDGING OR PERIMETER? ?
S5       2761   S1 AND S2 AND S3
S6        255   S4 AND S5
S7      20304   S2(5N)S4 OR S3(5N)S4
S8       1021   S1 AND S7
S9         86   S5 AND S8
S10        51   RD (unique items)
S11        32   S1(S)S7 AND S10
S12        32   Sort S11/ALL/PY,A
S13   1437482   MEMBRANE? ?
S14   1234125   SHAPE? ?
S15   1016567   SOUND? ? OR AUDIO? OR ACOUSTIC?
S16        80   S1 AND S2 AND S13 AND S14
S17        25   S15 AND S16
S18        20   S17 NOT S9
S19        17   RD (unique items)
S20        17   Sort S19/ALL/PY,A
S21        31   S16 NOT (S9 OR S17)
S22        25   RD (unique items)
S23        25   Sort S22/ALL/PY,A

 12/6/2     (Item 2 from file: 6)
0481427  NTIS Accession Number: N75-12271/3/XAB
  Ultrasonic Bone Densitometer
  (Patent)
  Filed patented 12 Nov 74

 12/6/4     (Item 4 from file: 2)
01850441   INSPEC Abstract Number: B82026825, C82017614
 Title: Automation of diagnostics of mechanical working conditions
  Publication Date: 1981

 12/6/7     (Item 7 from file: 2)
02999128   INSPEC Abstract Number: A87123318, B87071439
  Title:  Wideband  underwater  transducer  arrays  with  single acoustic
matching plate
  Publication Date: 1986

 12/6/8     (Item 8 from file: 94)
00342883   JICST ACCESSION NUMBER: 87A0025261  FILE SEGMENT: JICST-E
```

SAW filters using three- **transducer** configuration with outer **transducers** weighted by comb-**shaped** characteristics., 1986

12/6/9 (Item 9 from file: 2)
03055319 INSPEC Abstract Number: A88013049, B88010623
Title: Wideband underwater **transducer** array with single **acoustic** matching plate
Publication Date: July 1987

12/6/10 (Item 10 from file: 2)
03656868 INSPEC Abstract Number: A90088237, B90044233
Title: Modelling of the behaviour of a **piezo**electric vibrating element used in telephones
Publication Date: Feb. 1990

12/6/11 (Item 11 from file: 2)
03981575 INSPEC Abstract Number: A91121367, C91062888
Title: A wavenumber domain approach to the active control of structure-borne **sound**
Publication Date: 22 July 1991

12/6/13 (Item 13 from file: 2)
5292295 INSPEC Abstract Number: A9614-4385D-005, B9607-7320G-010
Title: A Lamb wave vibration sensor with a cellulose **membrane** diaphragm
Publication Date: Aug. 1995

12/6/14 (Item 14 from file: 2)
5172207 INSPEC Abstract Number: B9603-7220-009
Title: Specialised acousto-optical processor for input, display, and coherent-optical processing of multiparameter information from spaceborne telemetric systems
Publication Date: Oct. 1995

12/6/16 (Item 16 from file: 94)
03001832 JICST ACCESSION NUMBER: 96A0907539 FILE SEGMENT: JICST-E
Analysis of SAW Properties on Multi-Finger Gratings with Finite Thickness.
, 1996

12/6/18 (Item 18 from file: 34)
06693547 Genuine Article#: ZL179 Number of References: 23
Title: Voltage-mediated conformational changes of a polyelectrolyte in a linear elastic **membrane** (ABSTRACT AVAILABLE)
Publication date: 19980000

12/6/20 (Item 20 from file: 2)
6062788 INSPEC Abstract Number: A9823-8120S-001, B9812-0560-003
Title: Controlled ink-jet printing and deposition of organic polymers and solid particles
Publication Date: 19 Oct. 1998

12/6/21 (Item 21 from file: 2)
6691030 INSPEC Abstract Number: B2000-10-2860C-011
Title: Low-loss NSPUDT SAW filter without reversing the directivity of NSPUDT
Publication Date: 1999

12/6/23 (Item 23 from file: 8)
05443020
Title: Acousto-optic tunable filter based on tellurium dioxide in the subcollinear diffraction mode
Conference Title: Proceedings of the 1999 3rd International Conference on Optical Information Processing
Publication Year: 1999

12/6/25 (Item 25 from file: 2)
7301312 INSPEC Abstract Number: B2002-07-2575F-051
Title: Micromachined **piezo**electrically actuated flextensional **transducers** for high resolution printing and imaging
Publication Date: 2001

12/6/26 (Item 26 from file: 2)
6993786 INSPEC Abstract Number: A2001-17-4388-010, B2001-09-1270D-012
Title: Longitudinally coupled resonator filter using edge reflection of Bleustein-Gulyaev-Shimizu and shear horizontal waves with various bandwidths realized by selecting substrates
Publication Date: May 2001

12/6/27 (Item 27 from file: 8)
06760188
Title: Micromachined **Piezo**electrically Actuated Flextensional **Transducers** for High Resolution Printing
Conference Title: IS and T's NIP17: International Conference on Digital Printing Technologies
Publication Year: 2001

12/6/28 (Item 28 from file: 2)
7786222 INSPEC Abstract Number: A2003-24-4388-008, B2003-12-7810C-016
Title: Characterisation and comparison of a cMUT versus a **piezo**electric **transducer** for air applications
Publication Date: 2002

12/6/29 (Item 29 from file: 2)
7392172 INSPEC Abstract Number: B2002-11-1270D-001
Title: Very small IF resonator filters using reflection of shear horizontal wave at free edges of substrate
Publication Date: Sept. 2002

12/6/30 (Item 30 from file: 8)
06850091
Title: Development of an acousto-ultrasonic method for porous ceramics
Conference Title: Proceedings of the Tenth International Congress on **Sound** and Vibration
Publication Year: 2003

12/6/31 (Item 31 from file: 35)
01963901 ORDER NO: AADAA-I3098997
Model-based robust control designs for high performance magnetostrictive **transducers**
Year: 2003

12/6/32 (Item 32 from file: 94)
05717611 JICST ACCESSION NUMBER: 04A0177573 FILE SEGMENT: JICST-E

Ferroelectric and **Piezo**electric Properties of Disk **Shape** Lead Zirconate Titanate Thick Films, 2004

12/7/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
00071295 INSPEC Abstract Number: B69023457, C69010128
Title: **Piezo** -electric **transducer**
Inventor(s): List, H.
Patent Number: GB 1142983 Issue Date: 690212
Application Date: 680129
Priority Appl. Number: AT 1249 Priority Appl. Date: 670209
Country of Publication: UK
Language: English Document Type: Patent (PT)

Abstract: The **transducer** for producing a signal representing the pressure applied to an end surface of the instrument, may be constructed as a load cell or as a unit which may be subjected to hot gases, etc. The **transducer** consists of a body bored out to take a stack of **piezo** -electric crystal discs and an end cover over the assembly. The cover is formed by a **membrane** portion and a thicker edge portion with a centring shoulder which after assembly of the instrument is welded to the body to form a sealed unit. The cover is of such a **shape** as to apply a pre-stress pressure to the crystal stack whilst the whole assembly may be mounted in a chamber provided with connections for circulating a cooling liquid over the **transducer** to keep it at a desired temperature. Subfile: B

12/7/3 (Item 3 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
(c) 2004 Elsevier Eng. Info. Inc. All rts. reserv.
00588304 E.I. Monthly No: EI7612085525 E.I. Yearly No: EI76080960
Title: Choice of **Transducer** **Shapes** of Angle Probes for Ultrasonic Inspection.
Title: ZUR AUSWAHL DER MEMBRANFORMEN BEI WINKELPRUEFKOEPPEN FUER DIE ULTRASCHALLPRUEFUNG.
Author: Wuestenberg, Hermann; Schulz, Eduard; Moehrle, Walter; Kutzner, Juergen
Corporate Source: Bundesanst fuer Materialpruef, Berlin-Dahlem, Ger
Source: Materialpruefung v 18 n 7 Jul 1976 p 223-230
Publication Year: 1976
CODEN: MTPRAJ ISSN: 0025-5300
Language: GERMAN
Journal Announcement: 7612

Abstract: The availability of sensitive **piezo**electric materials offers a wide choice for the **shape** of rectangular membrances of angle probes. An attempt is therefore made to derive from the desired **sound** beam dimensions criteria for the size and **shape** of the **transducers** . The range of the **membrane** size can be derived from the required near-field length and the **sound** beam dimensions perpendicular to the beam axis that is required for a given problem. The side lengths ratio of the rectangular **membrane** depends on the desired **shape** of the **sound** field distribution in the **sound** beam cross section. 10 refs. In German.

12/7/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
01820708 INSPEC Abstract Number: A82020508, B82017604

Title: **Piezo**polymer **transducers** with point-supported **membranes**
Author(s): Lerch, R.
Author Affiliation: Inst. fur Elektroakustik, Tech. Hochschule Darmstadt, Darmstadt, West Germany
Journal: Journal of the **Acoustic**al Society of America vol.70, no.5 p.1229-34
Publication Date: Nov. 1981 Country of Publication: USA
CODEN: JASMAN ISSN: 0001-4966
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T); Experimental (X)

Abstract: Theoretical and experimental studies of electro**acoustic** **transducers** using a **piezo**electric foil **membrane** supported in its center by a rigid support are reported. The static as well as the dynamic deflections are described by the solutions of differential equations. In the case of **microphones** , a simplified calculation based on a superposition of the static and dynamic deflections of a ring- **shaped** **membrane** is described which represents a good approximation to the exact solution. For headphones, however, only the exact mathematical description of the mechanical system leads to useful results. While the sensitivities of such **microphone**s are in the range -55 to -60 dB V per N/m/sup 2/, the electro**acoustic** transmission factors of headphones with sizes suitable for telephone applications are in the range of 70 to 90 dB SPL re 1 V input voltage. (9 Refs) Subfile: A B

12/7/6 (Item 6 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
01756370 INSPEC Abstract Number: A81096149, B81047845
Title: Dome- **shaped** electro**acoustic** **transducer**s using thermoformed **piezo**electric polymer **membranes**
Author(s): Ravinet, P.; Guillou, D.; Micheron, F.
Author Affiliation: Lab. Central de Recherches, Thomson-CSF, Paris, France
Journal: Revue Technique Thomson-CSF vol.13, no.1 p.5-42
Publication Date: March 1981 Country of Publication: France
CODEN: RTTCBG ISSN: 0035-4279
Language: French Document Type: Journal Paper (JP)
Treatment: Practical (P)

Abstract: Polyvinylidene fluoride (PVF/sub 2/) is a **piezo**electric polymer which is very suitable for designing dome-**shaped** electro**acoustic** **transducers** obtained by thermoforming, whose behavior is similar to that of a portion of pulsating sphere. After an analysis of the normal mode vibrations of these domes, the sensitivity of the **microphones** and the efficiency of the **loudspeaker**s are calculated as functions of the geometrical and material parameters. These results are consistent with the measurements carried out on a series of domes with different geometries. A prototype of high range **loudspeaker** whose design is based on these concepts is described. (11 Refs) Subfile: A B

12/7/12 (Item 12 from file: 6)
DIALOG(R)File 6:NTIS
(c) 2004 NTIS, Intl Cpyrght All Rights Res. All rts. reserv.
1852455 NTIS Accession Number: N95-14110/7
Piezoelectric **Loudspeaker**
(Patent Application)
Regan, C. R. ; Jalink, A. ; Hellbaum, R. F. ; Rohrbach, W. W.

National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Corp. Source Codes: 019041001; ND210491
Report No.: PAT-APPL-8-326 804; NAS 1.71:LAR-15138-1
Filed 11 Oct 94 16p
Languages: English Document Type: Patent
Journal Announcement: GRAI9506; STAR3303

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NTIS Prices: PC N03/MF A04
Country of Publication: United States

A **piezo**electric **loudspeaker** suitable for midrange frequencies uses a dome **shaped** **piezo**electric actuator to drive a **speaker membrane** directly. The dome **shape**d actuator is made from a reduced and internally biased oxygen wafer, and generates excursion of the apex of the dome in the order of 0.02 - 0.05 inches when a rated drive voltage of 350 V rms is applied between the convex and the concave surfaces of the dome **shape**d actuator. The load capacity exceeds 10 lbs. The edge of the rim of the dome **shape**d actuator must be free to rock when the dome height varies to ensure low distortion in the **loudspeaker** . This is achieved by mounting the rim of the dome **shape**d actuator on a support surface by prestress only. An exceptionally simple design uses a planar **speaker membrane** with the center part of one side pressed against the rim of a dome **shape**d actuator by prestress from a stretched latex surround member.

12/7/15 (Item 15 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
5595689 INSPEC Abstract Number: A9713-4388-010, B9707-7810C-006
Title: Reciprocal electro**acoustic** **transducer**s based on **piezo**polymer films
Author(s): Ganenkov, N.; Zakrzhevsky, V.; Kunstler, W.
Author Affiliation: St. Petersburg Electrotech. Univ., Russia
Conference Title: 9th International Symposium on Electrets (ISE 9) Proceedings (Cat.No96CH35808) p.1073-8
Editor(s): Xia Zhongfu; Zhang Hongyan
Publisher: IEEE, New York, NY, USA
Publication Date: 1996 Country of Publication: USA xxi+1120 pp.
ISBN: 0 7803 2695 4 Material Identity Number: XX97-00154
U.S. Copyright Clearance Center Code: CH3508/96/0-7803-2695-4/96/$04.00
Conference Title: 9th International Symposium on Electrets (ISE 9) Proceedings
Conference Sponsor: IEEE Dielectr. & Electr. Insulation Soc
Conference Date: 25-30 Sept. 1996 Conference Location: Shanghai, China
Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T)

Abstract: The analysis of reciprocal **piezo**polymer **transducer**s with a dome- **shaped** **membrane** was carried out with a method which is a generalization of Lerch's method for a point-supported **membrane** . We have determined the influence of the main construction parameters on the **transducer** performance in both modes. (3 Refs) Subfile: A B
Copyright 1997, IEE

12/7/17 (Item 17 from file: 94)
DIALOG(R)File 94:JICST-EPlus
(c)2004 Japan Science and Tech Corp(JST). All rts. reserv.
03192335 JICST ACCESSION NUMBER: 97A0445201 FILE SEGMENT: JICST-E
New Actuators. **Piezo**electric Thin Film Ultraonic Actuator.
KUROSAWA MINORU (1)
(1) Univ. of Tokyo
Nippon Robotto Gakkaishi(Journal of the Robotics Society of Japan), 1997, VOL.15,NO.3, PAGE.326-329, FIG.5, TBL.1, REF.16
JOURNAL NUMBER: Y0482AAO ISSN NO: 0289-1824
UNIVERSAL DECIMAL CLASSIFICATION: 681.58+
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Review article
MEDIA TYPE: Printed Publication
ABSTRACT: Research and development of actuators using thin film materials aim at realizing microelements and integrated elements. The materials are **piezo**electric materials, super magnetrostrictive materials, **shape** memory alloys, heat bimorph, and the like. Design technique for actuators are roughly classified into a method using the elements whcih make flexure or longitudinal deformation, or a method combining flexure and longitudinal deformation, and a method utilizing ultrasonic vibrations. This paper explains mainly ultrasonic actuators. This paper describes materials and a film forming method of **piezo**electric thin films and application to **transducers** , and their operating methods, and talks about whether the operating frequency is resonance frequency or not. In addition, features and experimental circumstances of various micro ultrasonic motors are comprehensively outlined. Problems and limitations of microelements are discussed.

12/7/19 (Item 19 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
6528004 INSPEC Abstract Number: B2000-04-2860A-005, C2000-04-3260N-014
Title: **Piezo**electric double amplifier systems for air **acoustic** noise control
Author(s): Cross, L.E.
Author Affiliation: Intercoll. Mater. Res. Lab., Pennsylvania State Univ., University Park, PA, USA
Conference Title: Smart Materials and Structures. Proceedings of the 4th European Conference on Smart Structures and Materials in conjunction with the 2nd International Conference on Micromechanics, Intelligent Materials and Robotics p.185-93
Editor(s): Tomlinson, G.R.; Bullough, W.A.
Publisher: IOP Publishing, Bristol, UK
Publication Date: 1998 Country of Publication: UK xvii+834 pp.
ISBN: 0 7503 0547 9 Material Identity Number: XX-1998-01212
Conference Title: Proceedings of 4th European Conference on Smart Structures and Materials. 2nd MIMR International Conference on Micromechanics, Intelligent Materials and Robotics
Conference Date: 6-8 July 1998 Conference Location: Harrogate, UK
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P); Experimental (X)
Abstract: The **piezo**electric bimorph is a very well known amplifying structure, and more recently the "cymbal" modification of the "moonie"

structure has also been shown to provide gain. In this work the two concepts have been combined to develop a thin diaphragm structure driven by a U- **shaped** configuration of **piezo**electric bimorph and unimorph actuators, to act as an effective **acoustic** source which is both lighter and more compact than the equivalent electromagnetic **transducer** . The role of the diaphragm is twofold: it amplifies the tip displacement of the **piezo**electrics by a factor of 5-20 and also increases the source emitting area. Amplitude of vibration and useable frequency range depend on the dimensions and materials. In the current design, the overall dimensions of the device are 52*50*24 mm. Experiments have demonstrated diaphragm amplitude exceeding 0.5 mm in the range well below resonance (upsilon /sub r/~300-400 Hz) and useable response up to 1.5 kHz. Mechanical quality factor of the system is adjusted between 2 and 50 by a suitable choice of damping layer. The **transducer** developed was tested as a **sound** control element in the integrated system for active noise control. Six independently controlled PANELs were mounted over the vibrating aluminum plate forming an effective active skin. The adaptive feedforward filters -*LMS algorithm was employed in the six input, six output control scheme. Far field **microphones** were used for each of the six error sensors, while ten additional far field **microphones** enabled estimation of the **sound** power radiated before and after the implementation of control. Experiments revealed that attenuation of more than 10 dB is attainable over the frequency range of interest. A brief report will also be given of a new pseudo-shear mode driven diaphragm source which is being implemented for lower frequency higher amplitude control. (3 Refs) Subfile: B C
Copyright 2000, IEE

12/7/22 (Item 22 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
6221166 INSPEC Abstract Number: A1999-10-4388-009, B1999-05-7810C-022
Title: Influence of nonparallelism of the surfaces of a **piezo**electric layer on the frequency band of an electro**acoustic** **piezo**electric **transducer**
Author(s): Petrov, V.V.; Lapin, S.A.
Author Affiliation: Saratov State Univ., Saratov, Russia
Journal: Zhurnal Tekhnicheskoi Fiziki vol.69, no.3 p.72-3
Publisher: AIP,
Publication Date: March 1999 Country of Publication: Russia
CODEN: ZTEFA3 ISSN: 0044-4642
SICI: 0044-4642(199903)69:3L.72;1-#
Material Identity Number: B485-1999-004
Translated in: Technical Physics vol.44, no.3 p.289-91
Publication Date: March 1999 Country of Publication: USA
CODEN: TEPHEX ISSN: 1063-7842
SICI of Translation: 1063-7842(199903)44:3L.289:INSP;1-I
U.S. Copyright Clearance Center Code: 1063-7842/99/030289-3$15.00
Document Number: S1063-7842(99)01303-3
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: The influence of nonparallelism of the surfaces of a **piezo**electric **transducer** on its impedance and frequency band is analyzed theoretically. The model of a wedge- **shaped** **piezo**electric layer taken for the analysis consists of a set of n plane-parallel elements arranged in succession along the length of the **transducer** with a gradual increase in the thickness of the **piezo**electric layer. The analysis

performed demonstrates the possibility of significantly expanding the band of working frequencies of a **piezo**electric **transducer** when its electro**acoustic** conversion efficiency is reduced. In some cases, however, a decrease in conversion efficiency can be employed to optimize an **acoustic** device, for example, in creating a filter -type **piezo**electric **transducer** , where electromagnetic energy is converted into **acoustic** energy successively from one cell of the filter to another. The proposed method for expanding the frequency band can be useful, for example, in creating high-frequency acousto-optic Bragg cells. (3 Refs) Subfile: A B
Copyright 1999, IEE

12/7/24 (Item 24 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2004 Inst for Sci Info. All rts. reserv.
10207534 Genuine Article#: 496WM Number of References: 1
Title: Cylindrically **shaped** "W"- **membrane** **transducer**
Author(s): Jiao BL (REPRINT)
Corporate Source: Peking Univ,Dept Elect,Beijing 100871//Peoples R China/ (REPRINT); Peking Univ,Dept Elect,Beijing 100871//Peoples R China/
Journal: PROGRESS IN NATURAL SCIENCE, 2001, V11, S (MAY), PS31-S35
ISSN: 1002-0071 Publication date: 20010500
Publisher: TAYLOR & FRANCIS LTD, 11 NEW FETTER LANE, LONDON EC4P 4EE, ENGLAND
Language: English Document Type: ARTICLE
Abstract: This paper describes a new type of hydrophone referred to as the cylindrically **shaped** "w" **membrane** device. The **transducer** works in such a way that the hydro-pressure on the cylindrical profile is transferred into shear stress in the "w" **membrane** in which shear mode g(15) operates. The analysis shows that the amplitude of voltage response is proportional to radius of the cylindrical shell and independent of the thickness of the **membrane** . Both the sensitivity and the capacitance can be designed very high. This approach is confirmed by the simulation results.

20/6/2 (Item 2 from file: 94)
00285195 JICST ACCESSION NUMBER: 86A0399641 FILE SEGMENT: JICST-E
Ultrasonic ranging and imaging in air., 1986

20/6/5 (Item 5 from file: 94)
01397124 JICST ACCESSION NUMBER: 91A0911624 FILE SEGMENT: JICST-E
Measurement of cake thickness on **membrane** for microfiltration of yeast using ultrasonic polymer concave **transducer** . , 1991

20/6/6 (Item 6 from file: 34)
02386775 Genuine Article#: KX495 Number of References: 21
Title: ELECTROMAGNETIC **ACOUSTIC** -WAVE **TRANSDUCER** FOR THE GENERATION OF **ACOUSTIC** EVANESCENT WAVES ON **MEMBRANES** AND OPTICAL AND CAPACITOR WAVE-NUMBER SELECTIVE DETECTORS (Abstract Available)

20/6/7 (Item 7 from file: 94)
01690295 JICST ACCESSION NUMBER: 93A0257172 FILE SEGMENT: JICST-E
Piezoelectric Properties of ZnO Films Deposited by Using an ECR Sputtering System., 1993

20/6/9 (Item 9 from file: 2)
4925694 INSPEC Abstract Number: A9509-4385D-002
Title: Phase velocity measurements in bubbly liquids using a fiber optic

laser interferometer
  Publication Date: March 1995

20/6/12   (Item 12 from file: 94)
04251251   JICST ACCESSION NUMBER: 99A0632383 FILE SEGMENT: JICST-E
Cylindrical Micro Ultrasonic Motor Utilizing Bulk Lead Zirconate Titanate
    (PZT)., 1999

20/6/13   (Item 13 from file: 94)
04882043   JICST ACCESSION NUMBER: 01A0478560 FILE SEGMENT: JICST-E
Fabrication of texture controlled lead zirconate titanate film actuator.,
    2000

20/6/14   (Item 14 from file: 2)
7288815   INSPEC Abstract Number: A2002-14-4388-006, B2002-07-7810C-017
 Title: Ultra**sound** generator based on porous silicon
  Publication Date: 2001

20/6/15   (Item 15 from file: 8)
06037894
  Title: Characterization of micromachined silicon nitride **membrane** using resonant ultra**sound** spectroscopy
  Conference Title: 2001 Ultrasonics Symposium
  Publication Year: 2001

20/6/16   (Item 16 from file: 94)
05473147   JICST ACCESSION NUMBER: 03A0479761 FILE SEGMENT: JICST-E
Shear-Horizontal-Type Surface **Acoustic** Waves on Quartz with Ta2O5 Thin
    Film, 2003

20/6/17   (Item 17 from file: 94)
05817601   JICST ACCESSION NUMBER: 04A0504582 FILE SEGMENT: JICST-E
Low Loss Intermediate-Frequency Resonator Filter Using Shear Horizontal
    Type Leaky Surface **Acoustic** Wave on .ALPHA.-Phase Heavy Metal
    Film/Quartz, 2004

20/7,K/1   (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
01640466   INSPEC Abstract Number: B81012801
 Title: **Sound**er unit
  Author(s): Baumhauer, J.C., Jr.; Warren, J.E.; Ball, R.S.
  Journal: Technical Digest   no.59   p.1
  Publication Date: July 1980 Country of Publication: USA
  CODEN: TCHDAV ISSN: 0497-0411
  Language: English   Document Type: Journal Paper (JP)
  Treatment: Practical (P)
  Abstract: The **sound**er unit comprises a molded enclosure having a pair of spaced disk portions joined by a thin **membrane** that serves as a hinge. The disk portions are folded over on one another and a **piezo**electric **transducer** assembly is positioned between them. The **transducer** assembly includes a ceramic **audio** tone **transducer** and leads. The disk portions are **shaped** so as to only engage the perimeter of the **transducer** . A clamping portion of a contact clip is pressed onto each of three notched areas spaced about the perimeter of the disk portions to clamp the **transducer** assembly between the disk portions. Leads of the **transducer**

assembly are soldered to a middle portion of two of the contact clips, while a terminal portion at the ends of the clips is used to mount the unit to a printed circuit board and to make electrical connection to conductive paths on the board. (0 Refs) Subfile: B

Descriptors: **audio** equipment...
... **piezo**electric **transducers**
...Identifiers: **piezo**electric **transducer** assembly...
...ceramic **audio** tone **transducer** ;

20/7,K/3 (Item 3 from file: 94)
DIALOG(R)File 94:JICST-EPlus
(c)2004 Japan Science and Tech Corp(JST). All rts. reserv.
00458473 JICST ACCESSION NUMBER: 87A0387935 FILE SEGMENT: JICST-E
The manufacture of ceramic erectro**acoustic** **transducers** .
NAKAGAWA NAOKAZU (1); KURAMOTO KIYOHIKO (1); YAMAGUCHI TORU (1); HIRAI KAZUAKI (1)
(1) Nittsuko
Nitsuko Tech Rep, 1987, NO.14, PAGE.67-82, FIG.22, TBL.4, REF.3
JOURNAL NUMBER: F0373AAS ISSN NO: 1340-2854
UNIVERSAL DECIMAL CLASSIFICATION: 621.382:537.226.86
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Commentary
MEDIA TYPE: Printed Publication

ABSTRACT: Due to new advances in thin-film technology, **piezo** -ceramics are now used as miniature **acoustic** **transducers** in handsets. These **transducers** were made possible only by the development of thin diaphragms and a wide range of new materials. Lead zirconium titanium oxide is a ferro-dielectric material with a high **piezo** constant, as is well known, but there are several problem points concerning high-reliability **transducers** . These problems are caused because the heat expansion coefficient of the **piezo** -ceramic and metal, or consisting of diaphragms used in these materials are not constant. Improvements have been made by the clemency of thermal stress when gluing to the tops of diaphragms and by better selection of adhesives. **Piezo** -ceramic elements bend when alternating voltage is applied. Clear **sounds** are produced by utilizing the characteristics of this electro**acoustic** ferro-dielectric material so that vibrations of the metal diaphragm are converted to vibrations in the air. This **acoustic** **transducer** has no contacts, so there is no noise, and power consumption is low so application is possible in a variety of electronic components. Immediate application is expected because of the uniform **sound** pressure over a wide band, the light weight and thin **shape** .(author abst.)

...DESCRIPTORS: **acoustic** **transducer** ; ...
... **piezo**electric device...
... **piezo**electric vibrator
...BROADER DESCRIPTORS: **membrane** and film

20/7,K/4 (Item 4 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
(c) 2004 Elsevier Eng. Info. Inc. All rts. reserv.
03365148 E.I. Monthly No: EIM9201-000148
Title: Ultrasonic **transducers** with **piezo**electric polymer foil.
Author: Harnisch, F.; Kroemer, N.; Manthey, W.
Corporate Source: ELOTECH GmbH, Lobenstein, Ger

Conference Title: Proceedings of EUROSENSORS IV held jointly with SENSOREN Technologie und Anwendung
Conference Location: Karlsruhe, Ger Conference Date: 19901001
Sponsor: European Physical Soc; Convention of Natl Soc of Electrical Engineers of Western Europe; Deutsche Gessellschaft fuer Chemisches Apparatewesen, Chemische Technik & Biotechnologie e.V. (DECHEMA); Gessellschaft Deutscher Chemiker (GDCH); Deutsche Bunsen-Gesellschaft fuer Physikalische Chemie e.V.; et al
E.I. Conference No.: 14911
Source: Sensors and Actuators, A: Physical v 26 n 1-3 Mar 1991. p 549-552
Publication Year: 1991
CODEN: SAAPEB ISSN: 0924-4247
Language: English
Document Type: JA; (Journal Article) Treatment: A; (Applications); X; (Experimental)
Journal Announcement: 9201
Abstract: The application fields of ultrasonic measurement systems are mainly determined by the properties of ultrasonic **transducers** . **Acoustic** features of **transducers** using **piezo**electric polymer foils are considered. The directivity pattern and frequency range can easily be changed by variation of the geometric size and **shape** of such **transducers**. Their bandwidth is large in comparison to conventional **piezo**ceramic **transducers** . Foil **transducers** offer new applications for ultrasonic sensors in connection with digital signal processing algorithms. (Author abstract) 3 Refs.
Descriptors: *ULTRASONIC **TRANSDUCERS** ; **MEMBRANES** --...
...Polymeric; **PIEZO**ELECTRIC **TRANSDUCERS**
Identifiers: **PIEZO**ELECTRIC POLYMER FOIL; **PIEZO**POLYMER **TRANSDUCER** ; POLYVINYLIDENE FLUORIDE (PVDF)

20/7,K/8 (Item 8 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2004 Inst for Sci Info. All rts. reserv.
03405356 Genuine Article#: PB855 Number of References: 46
Title: A REVIEW OF SILICON **MICROPHONES**
Author(s): SCHEEPER PR; VANDERDONK AGH; OLTHUIS W; BERGVELD P
Corporate Source: BRUEL & KJOER,SKODSBORGVEJ 307/DK-2850 NOERUM//DENMARK/; TEXAS INSTRUMENTS HOLLAND BV/7600 AA ALMELO//NETHERLANDS/; UNIV TWENTE,MESA RES INST/7500 AE ENSCHEDE//NETHERLANDS/
Journal: SENSORS AND ACTUATORS A-PHYSICAL, 1994, V44, N1 (JUL), P1-11
ISSN: 0924-4247
Language: ENGLISH Document Type: REVIEW
Abstract: Silicon micromachining has successfully been applied to fabricate **piezo**electric , **piezo**resistive and capacitive **microphones** . The use of silicon has allowed the fabrication of **microphones** with integrated electronic circuitry and the development of the new FET **microphone** . The introduction of lithographic techniques has resulted in **microphones** with very small (1 mm2) diaphragms and with specially **shape**d backplates. The application of corrugated diaphragms seems a promising future development for silicon **microphones** . It is concluded from a noise consideration that the FET **microphone** shows a high noise level, which is mainly due to the small sensor capacitance. From this noise consideration, it can be shown that integration of a capacitive **microphone** and a preamplifier will result in a further reduction of the noise.
...Identifiers--CONDENSER **MICROPHONE** ; SUBMINIATURE **MICROPHONES** ;

ELECTRET **MICROPHONE** ; NITRIDE **MEMBRANE** ; BACK PLATE; **TRANSDUCER**; PRESSURE; **SOUND**
...Research Fronts: 1977 001 (SILICON PRESSURE SENSOR; ANISOTROPIC CRYSTAL ETCHING; DISSOLUTION SLOWNESS SURFACE; AQUEOUS CESIUM HYDROXIDE; ETCHED **SHAPE**S)

20/7,K/10 (Item 10 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2004 Inst for Sci Info. All rts. reserv.
06279551 Genuine Article#: YF764 Number of References: 53
Title: An implantable **piezo**electric hearing aid **transducer** for sensorineural hearing loss .1. Development of a prototype
Author(s): Leysieffer H (REPRINT) ; Baumann JW; Muller G; Zenner HP
Corporate Source: IMPLEX GHBH SPEZIALHORGERATE,MUNCHNER STR 101/D-85737 ISMANING//GERMANY/ (REPRINT); UNIV TUBINGEN,KLIN HALS NASEN OHRENHEILKUNDE/TUBINGEN//GERMANY/
Journal: HNO, 1997, V45, N10 (OCT), P792-800
ISSN: 0017-6192 Publication date: 19971000
Publisher: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010
Language: German Document Type: ARTICLE
Abstract: Implantable hearing aids can form the basis of new surgical techniques for dealing with hearing problems originating in the inner ear, provided they are fully implantable. Accordingly, a comprehensive, interdisciplinary, combined project was initiated at the ENT clinic of the University of Tubingen which was to conclude with operations to improve hearing via fully implantable hearing aids. A novel electromechanical **transducer** for implantable hearing aids based on the **piezo**electric principle is described. Unlike the **piezo**electric **transducer**s reported so far,this **transducer** does not rely on the bimorphic principle but on a circle- **shape**d , heteromorphic combination system consisting of a **piezo**ceramic disc and metal **membrane** . The **transducer** can be hermetically sealed and is designed for implantation into the mastoid. Transfer of mechanical oscillations to an ossicle in the middle ear is effected by a directly fixed coupling rod or via suitable coupling elements. The **transducer** is highly tuned with a resonance frequency at the upper end of the spectral transfer range (greater than 10 kHz). Below this resonance and down to low frequencies, the frequency response of elongation is smooth with amplitudes of around 20 nm. At low and middle frequencies of up to 1 kHz,these vibration amplitudes correspond to **sound** -pressure levels of around 90 dB SPL. At higher frequencies of up to 10 kHz,the output level increases to about 130 dB SPL. Nonlinear distortions are also very small at the highest levels (less than 0.1%) throughout the whole transfer range. Electric power consumption at maximum levels is in the range of a few microwatts and is therefore significantly lower than that of electromagnetic systems. Particularly, this makes it possible to use the **transducer** in fully implantable hearing aids for rehabilitation of sensorineural hearing loss.
Research Fronts: 95-6443 001 (OTO**ACOUSTIC** EMISSIONS; AUDITORY CONDITIONING; HIGH-FREQUENCY **ACOUSTIC** TRAUMA; VERTEBRATE HAIR-CELLS)

20/7,K/11 (Item 11 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
6473840 INSPEC Abstract Number: B2000-02-2860A-027, C2000-02-3240D-007
Title: Flexural **piezo**electric **transducers** with frequency agility

obtained via **membrane** loads
Author(s): Hebert, C.A.; Lesieutre, G.A.
Author Affiliation: Wyle Labs., El Segundo, CA, USA
Journal: Journal of Intelligent Material Systems and Structures vol.9, no.12 p.1030-7
Publisher: Technomic Publishing,
Publication Date: Dec. 1998 Country of Publication: USA
CODEN: JMSSER ISSN: 1045-389X
SICI: 1045-389X(199812)9:12L.1030:FPTW;1-Q
Material Identity Number: 0559-2000-002
U.S. Copyright Clearance Center Code: 1045-389X/98/121030-08$10.00/0
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T); Experimental (X)

Abstract: Broadband **transducers** find uses in many applications. One approach to increasing the bandwidth of a flexural **transducer** is to add damping to the device, usually decreasing its sensitivity in the process. An alternative approach, useful in some applications, involves active tuning of the natural frequency of a high-sensitivity narrowband device. In this research, **membrane** loads were used to alter the natural frequencies and electromechanical coupling coefficients of three-layer (trilaminar) **piezo**electric ceramic **transducers** . A coupling coefficient is a measure of the effectiveness with which a **piezo**electric material or device converts electrical energy to mechanical energy or vice versa. Applying in-plane loads increased the effectiveness of the **transducers** by increasing their operating frequency range, while maintaining high coupling coefficients. Two types of trilaminar flexural, **piezo**ceramic **transducers** were studied: beams and disks. The measured electrical impedance of individual devices was used to determine short- and open-circuit natural frequencies, and then coupling coefficients. In addition, finite element models were developed and used to predict the same quantities. Rotational springs were used in these models to account for non-ideal experimental boundary conditions, while reduction of the **piezo**electric material coupling accounted for loss of performance due to stress depoling and aging. Good agreement between experimental data and theory was obtained. Significant changes in natural frequencies, as well as increases in coupling coefficients were obtained for both beam and disk **transducers** . Experiments with the trilaminar **piezo**ceramic beams yielded a 36% change In frequency, with an accompanying 38% increase in coupling coefficient. Experiments with the disks yielded a change in frequency of 13%, and an increase in coupling coefficient of 15%. These results demonstrated the feasibility of using **membrane** loads to improve the frequency-agility of flexural **piezo**ceramic **transducers** . Candidate applications include **acoustic** **transducers** and pneumatic valves. (13 Refs) Subfile: B C
Copyright 2000, IEE

...Descriptors: **membranes** ; ...
... **piezo**electric **transducers** ;
Identifiers: flexural **piezo**electric **transducers** ; ...
... **membrane** loads...
...broadband **transducers** ; ...
...three-layer **piezo**electric ceramic **transducers** ; ...
... **acoustic** **transducers** ; ...
...mode **shapes** ;

23/6/1 (Item 1 from file: 8)
03437242
Title: Measurement of cake thickness on **membrane** for microfiltration of

yeast using ultrasonic polymer concave **transducer** .
Publication Year: 1991

23/6/2 (Item 2 from file: 35)
01256636 ORDER NO: AAD92-30203
MICROMECHANICS OF GRANULAR MATERIALS AND ITS RELATION TO WAVE VELOCITY
Year: 1992

23/6/3 (Item 3 from file: 95)
00632042 E92113965282
Characteristics of polysilicon resonant microbeams
(Charakteristika von Mikroschwingungen aus Polysilicium)
1992

23/6/4 (Item 4 from file: 35)
01368417 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
ON PROBES AND MEASURING TECHNIQUES FOR FAST-RESPONSE FLOW MEASUREMENT USING **PIEZO** -RESISTIVE PRESSURE **TRANSDUCERS**
Year: 1993

23/6/5 (Item 5 from file: 2)
4714416 INSPEC Abstract Number: B9409-7230-049
Title: Thermally driven micromechanical bridge resonators
Publication Date: 15 April 1994

23/6/6 (Item 6 from file: 95)
00918324 M95080941532
Shape control of inflatable reflectors
(Formregelung bei aufblasbaren Reflektoren)
1995

23/6/7 (Item 7 from file: 34)
05307946 Genuine Article#: VP294 Number of References: 17
Title: PARAMETRIC STUDY OF SEGMENTED **TRANSDUCERS** LAMINATED ON CYLINDRICAL-SHELLS .1. SENSOR PATCHES (Abstract Available)

23/6/8 (Item 8 from file: 8)
04640330
Title: Sensing/control of shell symmetrical modes using diagonal line sensors/actuators
Conference Title: Proceedings of the 1996 ASME International Mechanical Engineering Congress and Exposition
Publication Year: 1996

23/6/9 (Item 9 from file: 2)
5725656 INSPEC Abstract Number: B9712-7230-001, C9712-3240M-001
Title: Combined force and position polyvinylidene fluoride (PVDF) robotic tactile sensing system
Publication Date: 1997

23/6/10 (Item 10 from file: 8)
04910053
Title: High density circular-**shape** SOI iMEMS with intelligent pressure sensor
Conference Title: Proceedings of the 1997 IEEE International SOI Conference

Publication Year: 1997

23/6/11 (Item 11 from file: 144)
13507052 PASCAL No.: 98-0205418
Application of jet-printed PZT -layers for actuation of small beams, **membranes** and a 2-dimensional scanning actuator
Smart electronics and MEMS : Adelaide, 11-13 December 1997
1997

23/6/12 (Item 12 from file: 8)
05497799
Title: Micromachined flow handling components - micropumps
Conference Title: Proceedings of the 1999 Chemical Microsensors and Applications II
Publication Year: 1999

23/6/13 (Item 13 from file: 8)
05360161
Title: Design and sensitivity optimization of vibration sensors for tool state monitoring
Conference Title: Proceedings of the 1999 Design, Test, and Microfabrication of MEMS and MOEMS
Publication Year: 1999

23/6/14 (Item 14 from file: 2)
6594744 INSPEC Abstract Number: A2000-12-8170B-008, B2000-06-0590-035
Title: Variable waveform excitation of ceramic element **transducers** for ASTM E127 type reference block calibrations
Publication Date: March 2000

23/6/15 (Item 15 from file: 2)
7301396 INSPEC Abstract Number: A2002-15-8760B-073, B2002-07-7520-019, C2002-07-3385-022
Title: Integrated pressure and flow sensor in silicon-based ultrasonic surgical actuator
Publication Date: 2001

23/6/16 (Item 16 from file: 2)
7173031 INSPEC Abstract Number: C2002-03-3360L-015
Title: Limitations of using **membrane** theory for modeling PVDF patches on inflatable structures
Publication Date: Jan. 2001

23/6/18 (Item 18 from file: 2)
7385011 INSPEC Abstract Number: B2002-10-7230M-077
Title: Micro-sensor electromechanics and distributed signal analysis of **piezo** (electric)-elastic spherical shells
Publication Date: March-May 2002

23/6/19 (Item 19 from file: 2)
7384007 INSPEC Abstract Number: A2002-21-0630M-002, B2002-10-7320G-017
Title: Micro-sensing characteristics and modal voltages of linear/non-linear toroidal shells
Publication Date: 4 July 2002

23/6/20 (Item 20 from file: 2)

```
7743349   INSPEC Abstract Number: B2003-11-2575F-029
  Title:  Universal  concept for fabricating micron to millimeter sized 3-D
parylene structures on rigid and flexible substrates
  Publication Date: 2003

 23/6/21     (Item 21 from file: 8)
06460699
   Title:  Universal concept for fabricating micron to millimeter sized 3-D
parylene structures on rigid and flexible substrates
  Conference Title: IEEE Sixteenth Annual International Conference on Micro
Electro  Mechanical Systems
  Publication Year: 2003

 23/6/23     (Item 23 from file: 35)
01985376  ORDER NO: AADAA-I3112916
Gallium nitride-based micro-opto-electro-mechanical systems
  Year:    2003

 23/6/24     (Item 24 from file: 95)
01859017 20031100704
A study for development of small-CMM probe detecting contact angle
2003

 23/6/25     (Item 25 from file: 2)
7960311   INSPEC  Abstract  Number:  A2004-12-4340-017,  B2004-06-2575-018,
C2004-06-3120F-028
  Title: Micro-control actions and location sensitivity of actuator patches
laminated on toroidal shells
  Publication Date: April 2004

 23/7/17     (Item 17 from file: 2)
DIALOG(R)File   2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.
7426661   INSPEC Abstract Number: A2002-23-4388-007, B2002-12-2860A-003
  Title:  Fabrication  of  piezoelectric  diaphragm  using lead zirconate
titanate (PZT) films
  Author(s):   Hong,    E.;    Krishnaswamy,    S.V.;   Freidhoff,   C.B.;
Trolier-McKinstry, S.
  Author  Affiliation:   Mater.  Res.  Inst.,  Pennsylvania  State  Univ.,
University Park, PA, USA
  Conference  Title:  Materials  Science  of Microelectromechanical Systems
(MEMS)  Devices  IV.  Symposium  (Materials  Research  Society  Symposium
Proceedings Vol.687)    p.131-6
  Editor(s): Ayon, A.A.; Buchheit, T.E.; Kahn, H.; Spearing, S.M.
  Publisher: Mater. Res. Soc, Warrendale, PA, USA
  Publication Date: 2002  Country of Publication: USA    xi+318 pp.
  ISBN: 1 55899 623 0     Material Identity Number: XX-2002-02517
  Conference  Title:  Materials  Science  of Microelectromechanical Systems
(MEMS) Devices IV. Symposium
  Conference Date: 25-28 Nov. 2001    Conference Location: Boston, MA, USA
  Language: English    Document Type: Conference Paper (PA)
  Treatment: Practical (P); Experimental (X)
  Abstract:    Piezoelectric    diaphragms    were    fabricated   using   bulk
micromachining.  The  diaphragms  had a unimorph structure, where Pb(Zr/sub
0.52/Ti/sub 0.48/)O/sub 3/ (PZT) and thermally grown silicon oxide (SiO/sub
2/)  films  were  used  as  the active and passive layers, respectively. To
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actuate the diaphragms, two modes were designed: d/sub 31/ and d/sub 33/-mode. For d/sub 31/-mode diaphragms, a Si wafer with Pt/Ti/SiO/sub 2/ (0.5 mu m) was coated with ~1.2 mu m PZT. A Cr/Au top electrode was then evaporated. Each layer including the bottom electrode was patterned into a circular **shape** . To fabricate d/sub 33/-mode diaphragms, a Si wafer with thermal SiO/sub 2/ (0.5 mu m) was coated with ~0.3 mu m ZrO/sub 2/ and ~1.6 mu m of PZT. On top of these layers, a Cr/Au top electrode was deposited and patterned into a ring- **shape**d interdigitated **transducer** . Finally, both d/sub 31/ and d/sub 33/-mode diaphragms were released using deep reactive ion etching. Diameters of the fabricated diaphragms were in the range of 600 mu m and 1000 mu m. For d/sub 31/-mode diaphragms, the dielectric constant and loss of the released **piezo**electric layer at 1 kHz were > 800 and < 2%, respectively. The remanent polarization was ~20 mu C/cm/sup 2/ and the coercive field was ~61 kV/cm. Ferroelectric measurements showed well-developed hysteresis loops for the d/sub 33/-mode diaphragms. Both d/sub 31/ and d/sub 33/-mode diaphragms behave as **membranes** rather than plates. Their measured resonance frequencies were consistent with calculations from an analytic model for circular **membrane**s and ANSYS finite element analysis. (11 Refs) Subfile: A B
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23/7/22 (Item 22 from file: 94)
DIALOG(R)File 94:JICST-EPlus
(c)2004 Japan Science and Tech Corp(JST). All rts. reserv.
05567508 JICST ACCESSION NUMBER: 03A0591455 FILE SEGMENT: JICST-E
Simulation and Design of **Piezo**electric **Transducer** for Bio- **membrane** Sensor
JIANG Z (1); LI F (1); MIURA D (1); LIU Z (1)
(1) Yamaguchi Univ., Ube, Jpn
Nihon Kikai Gakkai Nenji Taikai Koen Ronbunshu, 2003, VOL.2003,NO.Vol.5, PAGE.315-316, FIG.5, REF.2
JOURNAL NUMBER: X0587BAW
UNIVERSAL DECIMAL CLASSIFICATION: 576.314 616-073:612-087
LANGUAGE: English COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Conference Proceeding
ARTICLE TYPE: Short Communication
MEDIA TYPE: Printed Publication
ABSTRACT: This study is concerned with the development of a **piezo**electric , embedded **transducer** , which can detect two or more species at one time. The **transducer** consists of a cantilever aluminum beam and a **piezo**ceramic patch. The prezoelectric impedance based measurement technique is introduced for detecting a very small bio-species mass. Furthermore, two different types of bio**membranes** are supposed coated on the beam so that they can detect two kinds of species without causing interference with one another. The problem how to determine the optimal positions for coating the **membrane**s are investigated in detail by FEM analysis. An optimal design consideration is proposed on their mode **shapes** and is validated experimentally. (author abst.)

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File 155:MEDLINE(R) 1951-2004/Dec W1
File   5:Biosis Previews(R) 1969-2004/Dec W2
File  73:EMBASE 1974-2004/Dec W2
Set     Items   Description
S1      66801   TRANSDUCER? ? OR LOUDSPEAKER? ? OR LOUD()SPEAKER? ? OR MIC-
             ROPHONE? ?
S2       7017   PIEZO OR PIEZOS OR PIEZOELECTRIC? OR PIEZOCERAMIC?
S3    2393379   MEMBRANE? ? OR FILTER? ?
S4     401406   SHAPE? ? OR EDGE? ? OR EDGING OR PERIMETER? ?
S5          5   S1 AND S2 AND S3 AND S4
S6          5   RD (unique items)
S7        128   (S1 AND S2 AND S3) NOT S4
S8     255496   SOUND? OR ACOUSTIC? OR AUDIO?
S9         69   S7 AND S8
S10     27668   S1/TI,DE
S11        48   S9 AND S10
S12        39   RD (unique items)
S13        48   S11 NOT S5
S14        39   Sort S12/ALL/PY,A
```

6/6/4   (Item 2 from file: 73)
06046653   EMBASE No: 1995076952
Phase velocity measurements in bubbly liquids using a fiber optic laser interferometer
1995

6/7,K/2   (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2004 The Dialog Corp. All rts. reserv.
12022620   PMID: 12243578
Very small IF resonator filters using reflection of shear horizontal wave at free edges of substrate.
Kadota Michio; Ago Junya; Horiuchi Hideya; Ikeura Mamoru
Murata MFG. Co., Ltd., Nagaokakyo, Kyoto, Japan. kadota@murata.co.jp
IEEE transactions on ultrasonics, ferroelectrics, and frequency control (United States) Sep 2002, 49 (9) p1269-79, ISSN 0885-3010
Journal Code: 9882735
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: PubMed not MEDLINE

A shear horizontal (SH) wave has the characteristic of complete reflection at the free edges of a substrate with a large dielectric constant. A conventional surface **acoustic** wave (SAW) resonator filter requires reflectors consisting of numerous grating fingers on both sides of interdigital **transducers** (IDTs). On the contrary, it is considered that small-sized and low loss resonator filters without reflectors consisting of grating fingers can be realized by exploiting this characteristic of the SH wave or the Bleustein-Gulyaev-Shimizu (BGS) wave. There are two types of resonator filters : transversely coupled and longitudinally coupled. No transversely coupled filters (neither conventional nor edge -reflection) using the SH wave on a single-crystal substrate have been realized until now, because two transverse modes (symmetrical and asymmetrical modes) are not easily coupled. However, the authors have realized small low loss transversely coupled resonator filters in the range of 25 to 52 MHz using edge reflections of the BGS wave on **piezo**electric ceramic (PZT:

Pb(Zr,Ti)O3) substrates for the first time by developing methods by which the two transverse modes could be coupled. On the other hand, longitudinally coupled resonator filters using edge reflection of the SH or BGS wave always have large spurious responses because of the even modes in the out-of-band range, because the frequencies of even modes do not coincide with the nulls of the frequency spectra of the IDTs. Consequently, longitudinally coupled resonator filters using the edge reflection of the SH wave have not been realized. By developing a method of reducing the spurious responses without increasing of the insertion loss, the authors have realized small low loss longitudinally coupled resonator filters in the range of 40 to 190 MHz using edge reflection of BGS or SH waves on PZT or 36 degrees-rotated-Y X-propagation LiTaO3 substrates for the first time. Despite being intermediate frequency (IF) filters , their package (3 x 3 x 1.03 mm3) sizes are as small as those of radio frequency (RF) SAW filters .

Record Date Created: 20020923
Record Date Completed: 20021108

6/7,K/5 (Item 3 from file: 73)
DIALOG(R)File 73:EMBASE
(c) 2004 Elsevier Science B.V. All rts. reserv.
02778951 EMBASE No: 1984047910

Reducing aberration by inverse filtering in Fresnel zone plate **transducers**

Mortezaie M.; Wade G.
Department of Electrical and Computer Engineering, University Of California, Santa Barbara, CA 93106 United States
Computer Programs in Biomedicine (COMPUT. PROGRAMS BIOMED.) (Netherlands) 1983, 17/1-2 (19-25)
CODEN: COPMB
DOCUMENT TYPE: Journal
LANGUAGE: ENGLISH

Transducers employing a spatial electrode pattern in the form of a Fresnel zone plate (FZP) are useful in **acoustic** imaging systems for focusing an ultrasonic beam. A technique has been developed to predict the spatial **acoustic** output of such a **transducer** from a knowledge of the spatial electrode pattern. It has been shown that, due to mechanical absorption, sharp edges in the electrode pattern are not reproduced in the output pattern. The mechanism producing the aberration can be modeled as a low-pass spatial filter . A desired **acoustic** spatial pattern may be generated by a synthesized electrode pattern obtained through inverse filtering. The approach is to assume that the desired **acoustic** pattern is the output of a linear spatial system and then to synthesize the electrode pattern that would produce it by multiplying it with the inverse of the aberrating low-pass filter . The synthesized electrode pattern will then generate an **acoustic** pattern which replicates the desired **acoustic** pattern very closely.

MEDICAL TERMS (UNCONTROLLED): **piezo**electric **transducer**

14/6/1 (Item 1 from file: 155)
05741191 PMID: 7316888
Comparison of **acoustic**ally coupled and mechanically coupled speech.
1981

14/6/2 (Item 2 from file: 5)
0003652497 BIOSIS NO.: 198274068920

SYNAPTIC MECHANISMS OF MON AURAL AND BIN AURAL PROCESSING IN THE LOCUST
LOCUSTA-MIGRATORIA
1982

14/6/3 (Item 3 from file: 73)
02314885 EMBASE No: 1983246046
PVDF **membrane** hydrophone performance properties and their relevance to the measurement of the **acoustic** output of medical ultrasonic equipment
1983

14/6/5 (Item 5 from file: 155)
07528007 PMID: 3620129
Stapes vibration produced by the output **transducer** of an implantable hearing aid. Experimental study.
Oct 1987

14/6/7 (Item 7 from file: 5)
0006041673 BIOSIS NO.: 198885010564
STAPES VIBRATION PRODUCED BY THE OUTPUT **TRANSDUCER** OF AN IMPLANTABLE HEARING AID
1987

14/6/8 (Item 8 from file: 155)
08139526 PMID: 2720766
Comparison of the frequency response characteristics of catheter-mounted **piezo**electric and micromanometric phono**transducers**.
May 1989

14/6/9 (Item 9 from file: 73)
05109359 EMBASE No: 1992249575
Modal sensing of efficient **acoustic** radiators with polyvinylidene fluoride distributed sensors in active structural **acoustic** control approaches
1992

14/6/10 (Item 10 from file: 155)
09526558 PMID: 1450303
[Laser-induced photo**acoustic** effects in the dentin]
Laserinduzierte photoakustische Effekte im Dentin.
1992

14/6/11 (Item 11 from file: 73)
05596154 EMBASE No: 1994004361
Transfer functions for **acoustic** emission **transducers** using laser interferometry
1993

14/6/12 (Item 12 from file: 73)
05321525 EMBASE No: 1993089610
A life-sized physical model of the human cochlea with optical holographic readout
1993

14/6/13 (Item 13 from file: 155)
09764563 PMID: 8329628
Comparison of short-time Fourier, wavelet and time-domain analyses of

intracardiac **sounds** .
1993

14/6/14 (Item 14 from file: 155)
09730369 PMID: 8509310
A hydromechanical model of the cochlea with nonlinear feedback using PVF2 bending **transducers**.
Apr 1993

14/6/15 (Item 15 from file: 73)
05781699 EMBASE No: 1994184092
Advanced time domain wave-number sensing for structural **acoustic** systems. II. Active radiation control of a simply supported beam
1994

14/6/17 (Item 17 from file: 73)
06716717 EMBASE No: 1996381701
Chirp response of a single-plate **transducer**
1996

14/6/18 (Item 18 from file: 73)
07061316 EMBASE No: 1997343172
An implantable hearing aid for sensorineural hearing loss: First implantation of **microphone** and **transducer** in patients
EIN IMPLANTIERBARES HORGERAT FUR INNENOHR-SCHWERHORIGKEITEN. KURZZEITIMPLANTATION VON MIKROPHON UND WANDLER
1997

14/6/20 (Item 20 from file: 73)
07061311 EMBASE No: 1997343167
Animal experiments with a **piezo**electrical implantable hearing aid **transducer** in the cat
IN-VIVO-UNTERSUCHUNGEN EINES **PIEZO**ELEKTRISCHEN IMPLANTIERBAREN HORGERATE-WANDLERS AN DER KATZE
1997

14/6/21 (Item 21 from file: 73)
06831903 EMBASE No: 1997114404
Lateral resonances in 1-3 **piezo**electric periodic composite: Modeling and experimental results
1997

14/6/22 (Item 22 from file: 155)
13706190 PMID: 9445860
[An implantable hearing aid for inner ear hearing loss. Short-term implantation of **microphone** and **transducer**]
Ein implantierbares Horgerat fur Innenohrschwerhorigkeiten. Kurzzeitimplantation von Mikrophon und Wandler.
Oct 1997

14/6/24 (Item 24 from file: 155)
13706185 PMID: 9445855
[In vivo studies of a **piezo**electric implantable hearing aid **transducer** in the cat]
In-vivo-Untersuchungen eines **piezo**elektrischen implantierbaren Horgeratewandlers an der Katze.

Oct 1997

14/6/25 (Item 25 from file: 73)
07568796 EMBASE No: 1999047026
Sensitivity measurements of **piezo**electric polymer hydrophones from 0.2-2 MHz using a broadband-pulse technique
1999

14/6/27 (Item 27 from file: 155)
14492424 PMID: 10489700
Implications of using colocated strain-based **transducers** for output active structural **acoustic** control.
Sep 1999

14/6/30 (Item 30 from file: 73)
11242867 EMBASE No: 2001257235
Signal processing in scanning thermo**acoustic** tomography in biological tissues
2001

14/6/32 (Item 32 from file: 155)
12206742 PMID: 12546145
Monolithic bulk shear-wave acousto-optic tunable filter .
Dec 2002

14/6/33 (Item 33 from file: 155)
12028670 PMID: 12322878
Narrowband impedance matching layer for high efficiency thickness mode ultrasonic **transducers**.
Mar 2002

14/6/34 (Item 34 from file: 73)
12209644 EMBASE No: 2003322712
Surface **acoustic** wave diffraction in spectral theory of interdigital **transducers**
01 AUG 2003

14/6/35 (Item 35 from file: 73)
11928444 EMBASE No: 2003037826
Electromechanical coupling factor of capacitive micromachined ultrasonic **transducers**
01 JAN 2003

14/6/36 (Item 36 from file: 155)
15698554 PMID: 14609066
Characteristics of MgxZn1-xO thin film bulk **acoustic** wave devices.
Oct 2003

14/6/37 (Item 37 from file: 155)
12394047 PMID: 12782255
Calibration of ultrasonic hydrophone probes up to 100 MHz using time gating frequency analysis and finite amplitude waves.
Jun 2003

14/6/38 (Item 38 from file: 73)
12673058 EMBASE No: 2004259967

```
  Amplitude and phase calibration of hydrophones up to 70 MHz using
broadband pulse excitation and an optical reference hydrophone
  2004

 14/6/39     (Item 39 from file: 155)
16553069   PMID: 15217239
    Acoustic   impedance  matching of piezoelectric transducers to the air.
May 2004

 14/7,K/4     (Item 4 from file: 5)
DIALOG(R)File   5:Biosis Previews(R)
(c) 2004 BIOSIS. All rts. reserv.
0004104992   BIOSIS NO.: 198427020411
 SOUND  PICKUP UTILIZING AN IMPLANTABLE  PIEZO  ELECTRIC CERAMIC BIMORPH
  ELEMENT APPLICATION TO THE COCHLEAR IMPLANT
AUTHOR: GYO K (Reprint); YANAGIHARA N; ARAKI H
AUTHOR ADDRESS: DEP OTOLARYNGOL, EHIME UNIV SCH MED, SHIGENOBU-CHO,
  ONSEN-GUN, EHIME, JAPAN 791-02**JAPAN
JOURNAL: American Journal of Otology  5 (4): p273-276 1984
ISSN: 0192-9763
DOCUMENT TYPE: Article
RECORD TYPE: Citation
LANGUAGE: ENGLISH
DESCRIPTORS: HUMAN TYMPANIC  MEMBRANE  ELECTRO MECHANICAL  TRANSDUCER
TEMPORAL BONES

 14/7,K/6     (Item 6 from file: 5)
DIALOG(R)File   5:Biosis Previews(R)
(c) 2004 BIOSIS. All rts. reserv.
0006147720   BIOSIS NO.: 198885116611
NEW  PIEZOELECTRIC  POLYMER  TRANSDUCERS  AND THEIR APPLICATIONS IN
  CLINICAL ULTRASONIC DIAGNOSIS
AUTHOR: TANE S (Reprint); KAKEHASHI T
AUTHOR ADDRESS: DEP OPHTHALMOL, ST MARIANNA UNIV SCH MED
JOURNAL: Folia Ophthalmologica Japonica  38 (11): p1763 1987
ISSN: 0015-5667
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: JAPANESE
ABSTRACT: Polyvinyliden-fluoride (PVDF) with a low  acoustic  impedance
  close to those of water and tissue, is most suitable for use in
  diagnostic ultrasound  transducers . To improve echogram image quality,
  we have developed concave  transducers  with the following frequencies
  and apertures, using PVDF: (a) 10 MHz, 10 mm.vphi., (b) 15 MHz, 10
  mm.vphi., (c) 20 MHz, 10 mm.vphi.. Due to their higher resolution both in
  the axial and lateral directions, the image quality obtained using these
  PVDF  transducers  is definitely superior to that using conventional PZT
  transducers . The  transducers  of 10 and 15 MHz are of a sensitivity
  sufficient for clinical ophthalmic examination of such ocular
  pathological conditions as vitreous hemorrhage and  membrane ,
  intraocular tumors, retinal detachment and various orbital disorders.
  Example of echograms taken with PVDF  transducers  are demonstrated and
  applications of PVDF to clinical ultrasonic diagnosis are briefly reviewed.

 14/7,K/16     (Item 16 from file: 73)
DIALOG(R)File  73:EMBASE
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06035203 EMBASE No: 1995065443

The round window electromagnetic implantable hearing aid approach

Spindel J.H.; Lambert P.R.; Ruth R.A.

Department of Otolaryngology-HNS, UVA Health Sciences Center, Box 430, Jefferson Park Avenue,Charlottesville, VA 22908 United States

Otolaryngologic Clinics of North America (OTOLARYNGOL. CLIN. NORTH AM.) (United States) 1995, 28/1 (189-205)

CODEN: OCNAB ISSN: 0030-6665

DOCUMENT TYPE: Journal; Review

LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH

The round window electromagnetic implantable hearing aid (RWEM) approach uses a magnet surgically implanted onto the round window **membrane** of the cochlea to impart vibrational energy to the inner ear when driven by a nearby electromagnetic coil. In this article, experimental methods used in animal ABR studies are described for this approach and evidence for the viability of this technique is demonstrated by the similarity of ABR waveforms obtained using RWEM and **acoustic**ally -evoked stimuli.

MEDICAL DESCRIPTORS:
animal experiment; animal model; bone conduction; cochlea fenestra; electromagnetic field; hearing aid; implant; nonhuman; **piezo**electricity ; review; **transducer**

14/7,K/19 (Item 19 from file: 73)
DIALOG(R)File 73:EMBASE
(c) 2004 Elsevier Science B.V. All rts. reserv.

07061313 EMBASE No: 1997343169

Adaption of the geometry of implantable hearing aid components to the human temporal bone. Part II: **Microphone**

ANPASSUNG DER GEOMETRIE IMPLANTIERBARER HORGERATEKOMPONENTEN AN DAS MENSCHLICHE FELSENBEIN. TEIL II: MIKROFON

Maassen M.M.; Lehner R.L.; Muller G.; Reischl G.; Ludtke R.; Leysieffer H.; Zenner H.P.

Dr. M.M. Maassen, Universitats-HNO-Klinik, Silcherstrasse 5, D-72076 Tubingen Germany

HNO (HNO) (Germany) 1997, 45/10 (847-854)

CODEN: HBZHA ISSN: 0017-6192

DOCUMENT TYPE: Journal; Article

LANGUAGE: GERMAN SUMMARY LANGUAGE: ENGLISH; GERMAN

NUMBER OF REFERENCES: 26

Recently, an implantable hearing aid for rehabilitation of sensorineural hearing loss has been developed. One component of the device is the **microphone** for implantation into the posterior canal wall. The **membrane** of the **microphone** can be covered by skin, cartilage, or fascia, avoiding reduction in **sound** transmission at the same time. In the study presented here, the **microphone** was implanted into 50 cadaver specimens of human temporal bone. Localization of the **microphone** was determined by the anatomical situation of the facial nerve. The **microphone** and the **piezo**electric **transducer** could be implanted in 78% of the temporal bones after total mastoidectomy. In the final version of the **microphone** , the size was 4.5 mm and total weight 400 mg.

MEDICAL DESCRIPTORS:
*hearing aid; * **microphone** ; *temporal bone
article; cadaver; facial nerve; human; human tissue; implant; **piezo**electricity ; surgical anatomy

14/7,K/26 (Item 26 from file: 73)
DIALOG(R)File 73:EMBASE
(c) 2004 Elsevier Science B.V. All rts. reserv.
07539571 EMBASE No: 1999024341

Multivariable feedback active structural **acoustic** control using adaptive **piezo**electric sensoriactuators

Vipperman J.S.; Clark R.L.

J.S. Vipperman, Department of Mechanical Engineering, 5711 Boardman Hall, University of Maine, Orono, ME 04401-5711 United States

Journal of the **Acoustic**al Society of America (J. ACOUST. SOC. AM.) (United States) 1999, 105/1 (219-225)

CODEN: JASMA ISSN: 0001-4966
DOCUMENT TYPE: Journal; Article
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
NUMBER OF REFERENCES: 19

An experimental implementation of a multivariable feedback active structural **acoustic** control system is demonstrated on a **piezo**structure plate with pinned boundary conditions. Four adaptive **piezo**electric sensoriactuators provide an array of truly colocated actuator/sensor pairs to be used as control **transducers**. Radiation filters are developed based on the self- and mutual-radiation efficiencies of the structure and are included into the performance cost of an Hinf 2 control law which minimizes total radiated **sound** power in the cost function, control effort is balanced with reductions in radiated **sound** power. A similarity transform which produces generalized velocity states that are required as inputs to the radiation filters is presented. Up to 15 dB of attenuation in radiated **sound** power was observed at the resonant frequencies of the **piezo**structure.

14/7,K/28 (Item 28 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2004 The Dialog Corp. All rts. reserv.
10859627 PMID: 10993549

In vivo experiments in the cat with an implantable **piezo**electric hearing aid **transducer** .

Plinkert P K; Baumann J W; Lenarz T; Keiner S; Leysieffer H; Zenner H P

Department of Otorhinolaryngology, University of Tubingen, Germany.

European archives of oto-rhino-laryngology - official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) - affiliated with the German Society for Oto-Rhino-Laryngolog (GERMANY) 2000, 257 (6) p304-13, ISSN 0937-4477 Journal Code: 9002937

Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed

We have recently developed an implantable **piezo**electric hearing aid **transducer** that is suitable for implantation in patients with sensorineural hearing loss. The **transducer** does not transmit **sound** but conducts micromechanical vibrations to the cochlea. In ten cat ears we investigated the efficiency of the implantable **transducer** with respect to the direct transfer of vibrations within the audible frequency range via the ossicles to the cochlea or directly into the vestibule. The **acoustic**ally evoked brainstem potential (ABR) threshold was determined prior to implantation, and the middle ear was then opened and the **piezo**electric **transducer** coupled to the ossicles or to the perilymph. **Acoustic**ally evoked brainstem potentials were recorded following stimulation at the umbo, long process of the incus, stapes head, stapes foot plate, and in the vestibulum. Comparisons of the **acoustic**ally and mechanically evoked thresholds revealed a good correlation of the two stimulation levels. An electrical **transducer** voltage of 1 V(RMS) produced equivalent **sound** pressure levels (SPL) of 100-128 dB at the tympanic **membrane** . To assess the hearing we compared stimulus-dependent latencies of the early potentials (peaks P1-P5) and thresholds. This evaluation was based on four ears with normal hearing in which the **piezo**electric **transducer** was coupled to the long process of the incus. The mean values of the latencies and their scattering range correlated extremely well in the two stimulation modes. They were nearly identical when the equivalent SPL of 100 dB was assigned to the maximally applied electrical level of 0 dB. These in vitro and in vivo findings demonstrate that the characteristics of the **transducer** warrant its development further from the prototype stage to become a component of an implantable hearing device for patients with sensorineural hearing loss.

Record Date Created: 20001211
Record Date Completed: 20001228
; **Acoustic** Stimulation; Animals; **Audio**metry ; Cats; Evoked Potentials, Auditory, Brain Stem; **Transducers**

14/7,K/29 (Item 29 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2004 The Dialog Corp. All rts. reserv.
10623815 PMID: 10733184

Human studies of a **piezo**electric **transducer** and a **microphone** for a totally implantable electronic hearing device.

Zenner H P; Leysieffer H; Maassen M; Lehner R; Lenarz T; Baumann J; Keiner S; Plinkert P K; McElveen J T

Department of Otolaryngology, University of Tubingen, Germany.

American journal of otology (UNITED STATES) Mar 2000, 21 (2) p196-204, ISSN 0192-9763 Journal Code: 7909513

Document type: Clinical Trial; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed

OBJECTIVE: For the surgical treatment of patients with moderate and severe sensorineural hearing loss, the authors have developed a totally implantable hearing device, the totally integrated cochlea amplifier (TICA). To evaluate the effectiveness of **transducer** and **microphone** of this device, three separate human studies were conducted. STUDY DESIGN: The first study using **transducer** prototypes involved self experiments in investigators with normal hearing. The second study used the **transducer** prototypes in patients with hearing loss, and the third study involved the temporary implantation of the final **transducer** prototype and **microphone** in patients undergoing otologic surgery. PATIENTS: In routine middle ear surgery, **transducer** prototypes were coupled to the ossicular chain of 28 patients. In addition to the **transducer**, in 5 patients the **microphone** was placed beneath the skin of the auditory canal, allowing the skin to cover the **microphone** **membrane** completely. RESULTS: The **piezo**electric **transducer** reached an equivalent **sound** pressure level of 145 dB SPL < or =10 kHz. The dynamics for music reached 32 dB, which was identical with the results of the preoperative investigations using high-fidelity headsets (33 dB). The low nonlinear distortions of <0.1% and the frequency range of 10 kHz are reflected in the positive evaluation of the **sound** quality by 84% of the patients involved. When phonetically balanced speech material and music were presented under free field conditions at a **sound** level of 65 dB SPL,

understanding of the phonetically balanced speech material was 100%. Most patients judged the presentations of music as clear and undistorted with all broadband components. CONCLUSIONS: Data in humans on the performance of the two main components of the TICA implant, the **transducer** and the **microphone**, are reported.
Record Date Created: 20000503
Record Date Completed: 20000503
; Amplifiers; **Audio**metry , Pure-Tone--methods--MT; Auditory Perception --physiology--PH; Cochlear Implantation; Equipment Design; Otologic Surgical Procedures--methods--MT; Preoperative Care; Psycho**acoustics**; **Transducers**

14/7,K/31 (Item 31 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2004 The Dialog Corp. All rts. reserv.
11271121 PMID: 11349775
Biomechanical aspects in implantable **microphone**s and hearing aids and development of a concept with a hydro**acoustic**al transmission.
Huttenbrink K B; Zahnert T H; Bornitz M; Hofmann G
Department of Otorhinolaryngology, University of Dresden, Medical School, Germany.
Acta oto-laryngologica (Norway) Jan 2001, 121 (2) p185-9, ISSN 0001-6489 Journal Code: 0370354
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
The middle ear functions as a sensitive pressure receptor. This implies that it not only transmits **sound** pressure waves with molecule-sized vibrational amplitudes, but that it also reacts to the million times larger variations of ambient air pressure. This pressure induces movements of the tympanic **membrane** and of the attached ossicular chain of up to 1,000 microm. Any artificial device that contacts these **sound** -transporting elements, be it a receiver for an implantable **microphone** or a **transducer** for an implantable hearing aid, has to respect these two different modes of biomechanical behavior. A hydro**acoustic**al transmission system has therefore been developed consisting of a water-filled flexible tube, which contacts the ossicular chain with a balloon tip, and which is connected to a **piezo** -electric **transducer** at its other end. This soft contact prevents a localized pressure load and does not restrain the free movement of the underlying ossicle during ambient pressure variations. Temporal bone experiments showed that the device transmits vibration energy in good **acoustic**al quality. The device can also be used in a reverse mode, working as a **microphone** , for example for a totally implantable hearing aid or a cochlear implant. This **microphone** concept has the advantage that it incorporates the biologic **sound** receiving components (the tympanic **membrane** and the ossicular chain micromechanics) into a technical device.
Record Date Created: 20010514
Record Date Completed: 20011018
Descriptors: *Ear Ossicles--physiopathology--PP; *Hearing--physiology--PH ; *Hearing Aids; *Prosthesis Implantation; *Tympanic **Membrane** --physiopathology--PP; Biomechanics; Cochlear Implants; Prosthesis Design; **Transducers** ; Vibration

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File   9:Business & Industry(R) Jul/1994-2004/Dec 22
File  15:ABI/Inform(R) 1971-2004/Dec 24
File  16:Gale Group PROMT(R) 1990-2004/Dec 22
File 160:Gale Group PROMT(R) 1972-1989
File 148:Gale Group Trade & Industry DB 1976-2004/Dec 22
File 621:Gale Group New Prod.Annou.(R) 1985-2004/Dec 22
File  80:TGG Aerospace/Def.Mkts(R) 1982-2004/Dec 22
File 481:DELPHES Eur Bus 95-2004/Dec W2
File 624:McGraw-Hill Publications 1985-2004/Dec 22
File 635:Business Dateline(R) 1985-2004/Dec 23
File 636:Gale Group Newsletter DB(TM) 1987-2004/Dec 22
File  20:Dialog Global Reporter 1997-2004/Dec 24
Set     Items   Description
S1     153885   TRANSDUCER? ? OR LOUDSPEAKER? ? OR LOUD()SPEAKER? ? OR MIC-
             ROPHONE? ?
S2      14076   PIEZO OR PIEZOS OR PIEZOELECTRIC? OR PIEZOCERAMIC?
S3     460196   MEMBRANE? ? OR FILTER? ?
S4    3024833   SHAPE? ? OR EDGE? ? OR EDGING OR PERIMETER? ?
S5          6   S1(S)S2(S)S3(S)S4
S6          5   RD (unique items)
S7    3393545   SOUND? OR ACOUSTIC? OR AUDIO?
S8         58   S1(S)S2(S)S3(S)S7
S9          1   S1/TI,DE AND S8
S10    104775   MEMBRANE? ?
S11         9   S1(S)S2(S)S10(S)S7
S12         8   S11 NOT (S5 OR S9)
S13         8   RD (unique items)

 6/3,K/2     (Item 2 from file: 16)
DIALOG(R)File  16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.
04574316    Supplier Number: 46724252  (USE FORMAT 7 FOR FULLTEXT)
Sensor and Sensibility
Electronics Times, p38
Sept 19, 1996
Language:  English    Record Type:  Fulltext
Document Type: Magazine/Journal; Trade
Word Count:   1001
...     sensors uses surface acoustic waves, a non-contact measuring
technique also used as an electronic  filter  in telecoms equipment.
Surface waves are produced by passing an alternating voltage across the
terminals of two interleaved comb- shaped  arrays laid on one end of a
piezoelectric  substrate. A similar array at the other end of the
transducer  converts the wave back into an electrical signal.
     The transducer is fixed to the surface...

9/3,K/1     (Item 1 from file: 160)
DIALOG(R)File 160:Gale Group PROMT(R)
(c) 1999 The Gale Group. All rts. reserv.
01147758
Matsushita develops a super directional speaker.
JOURNAL OF THE ELECTRONICS INDUSTRY   December, 1984    p. 54,55
    ... speakers  developed earlier have several disadvantages, including a
low  conversion  efficiency from ultrasound to audible  sound  and the need
for  a   filter   to  shield  the  body  from  strong  UV rays. With the new
superdirectional  speaker, the problems of conventional parametric speakers
```

are solved by using a convergent **sound** source formed by attaching 6,600 **piezo**electric ultrasonic **transducers** on 3 substrates in a honeycomb configuration to obtain a **sound** pressure level large enough for sharper directivity than previously possible. An **acoustic** filter greatly attenuates the ultra**sound** level.> ...
PRODUCT NAME: ***Loudspeaker** s Sold Separately

13/3,K/6 (Item 1 from file: 160)
DIALOG(R)File 160:Gale Group PROMT(R)
(c) 1999 The Gale Group. All rts. reserv.
00701432
Piezo Electric Products will develop products based on **piezo**electric plastic and ceramic materials, and Pennwalt will offer a polyvinylidene fluoride **piezo**electric plastic.
Chemical Week December 2, 1981 p. 46,471

Piezoelectri c materials convert vibrational energy into electrical energy or vice-versa. **Piezo** Electric Products will produce a high-speed dot-matrix printer, a miniature fan for electronic...
... generator which will utilize automobile exhaust gases. Pennwalt's material may be used in telephone **transducers** . **Piezo**electric materials can increase the number of dots per character that can be printed by a...
...to provide a constant flow of air. The generator uses auto exhaust gases to vibrate **piezo**electric **membranes** to produce electricity. **Piezo**electric materials have always been brittle, but PEP feels a new manufacturing process will end that problem. Ceramic **piezo**electric materials are produced by sintering powders of barium titanate, lead zirconate, ethylene diamine tartrate,, dipotassium...
...cooling them in an electrical field to produce a dipole aligned with the applied field. **Piezo**electric plastics may be used in telephones to improve fidelity of voice transmission, switching devices, underwater **sound** detectors, ultrasonic sensors for medical diagnostic equipment and fire alarms. Bell Labs is currently researching the application of **piezo** plastics to telephones...

13/3,K/8 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2004 The Dialog Corp. All rts. reserv.
05664003 (USE FORMAT 7 OR 9 FOR FULLTEXT)
St. Croix Medical Bucks Device Market Doldrums and Brings in Millions of Dollars
BUSINESS WIRE
June 08, 1999
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 369
... severe hearing loss.

The concept of the Envoy totally implantable system is the use of **piezo**electric **transducers** placed on the malleus and the stapes (bones the size of grains of rice in the middle ear). The first **transducer** (the sensor) detects the tympanic **membrane** motion from the malleus or incus in response to incoming **sound** . This **sound** signal is then processed to meet the patient's hearing loss profile and used to drive a second **piezo**electric **transducer** (the driver) placed on the stapes. This vibrates the stapes and the mechanical vibration is detected as high fidelity **sound** .

The entire implanted System is sufficiently small to be implanted subcutaneously and is invisible to...

```
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200482
File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)
Set     Items    Description
S1      172738   TRANSDUCER? ? OR LOUDSPEAKER? ? OR LOUD()SPEAKER? ? OR MIC-
             ROPHONE? ?
S2      172060   PIEZO OR PIEZOS OR PIEZOELECTRIC? OR PIEZOCERAMIC?
S3      743858   MEMBRANE? ? OR FILTER? ?
S4     2508390   SHAPE? ? OR EDGE? ? OR EDGING OR PERIMETER? ?
S5       22569   IC=(H04R-017? OR H04R-025? OR H04R-031? OR H04R-000?)
S6        3570   IC=(G10H-003? OR G10H-005?)
S7         321   S1 AND S2 AND S3 AND S4
S8          58   S5 AND S7
S9        4455   IC=H04R-031?
S10          2   S9 AND S8
S11    1766529   SHAPE?
S12        239   S1 AND S2 AND S3 AND S11
S13         42   S5:S6 AND S12
S14        151   S1 AND S2(S)S3(S)S4
S15         39   S5:S6 AND S14
S16         39   S15 NOT S10
S17         34   S1/TI AND S16
S18        123   S1 (S)S2(S)S3(S)S4
S19         29   S16 AND S18
S20         19   S13 NOT (S10 OR S19)

10/7,K/1     (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
016183881     **Image available**
WPI Acc No: 2004-341767/200432
  Flexible micro-electromechanical system  transducer  used in wireless
  microphone , sequentially includes flexible substrate,  membrane  layer,
  lower electrode, active layer, upper electrode., and connecting pads
Patent Assignee: SAMSUNG ELECTRONICS CO LTD (SMSU  ); LEE S (LEES-I); NAM Y
  (NAMY-I)
Inventor: LEE S; NAM Y; LEE S H; NAM Y U
Number of Countries: 035  Number of Patents: 005
Patent Family:
Patent No      Kind   Date     Applicat No    Kind   Date      Week
EP 1403212      A2   20040331  EP 2003256049   A   20030925  200432  B
JP 2004120761  A     20040415  JP 2003335768   A   20030926  200432
US 20040061543  A1   20040401  US 2003669428   A   20030925  200432
KR 2004026756  A     20040401  KR 200258313    A   20020926  200451
CN 1517296      A    20040804  CN 2003165014   A   20030926  200475
Priority Applications (No Type Date): KR 200258313 A 20020926
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
EP 1403212    A2 E  18 B81B-003/00
   Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
   GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR
JP 2004120761 A     15 H04R-017/02
US 20040061543 A1      G06G-007/18
KR 2004026756 A        H04R-031/00
CN 1517296    A        B81C-001/00
Abstract (Basic): EP 1403212 A2
        NOVELTY - A flexible micro-electromechanical system (MEMS)
```

transducer includes a flexible substrate (100); **membrane** layer (220) deposited on the substrate and has raised part of a predetermined length; lower and upper electrode layers (230, 250) formed by from a conductive material; active layer (240) formed by depositing a **piezo** -polymer between the electrode; and connecting pads (271, 272) each connected to respective electrode layer.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(a) manufacturing the above MEMS **transducer** by forming sacrificial layer on the substrate; depositing a **membrane** layer on the sacrificial layer by plasma enhanced chemical vapor deposition (PECVD), followed by patterning; depositing a lower electrode layer on the **membrane** layer and patterning the lower electrode; sequentially depositing an active layer and an upper electrode, and patterning them; forming a first connecting part to be connected to the lower electrode layer and a second connecting pad to be connected to the upper electrode layer; and removing the sacrificial layer;

(b) a flexible wireless MEMS **microphone** comprising flexible substrate; a flexible MEMS **transducer** structure formed on the substrate by PECVD; an antenna printed on the substrate for communicating with an outside source; a wire and interface circuit embedded in the substrate to connect the flexible MEMS **transducer** and the antenna; a flexible battery layer connected to the substrate; and a Bluetooth (RTM) module layer.

USE - Used in micro-electromechanical system wireless **microphone** (claimed).

ADVANTAGE - The MEMS **transducer** provides MEMS wireless **microphone** that has characteristics of softness, flexibility, and foldability. Specifically, the **transducer** structure can be prepared using a low-temperature process, thus it is possible to produce a flexible **microphone** system having excellent characteristics in terms of degree of integration, mobility, softness, flexibility, foldability and wearability by a simple process at a low temperature and at a reduced cost. Moreover, it is possible to package a skin-type **microphone** with a desired thickness that can be attached to the body and a three-dimensional **microphone** due to its flexibility and foldability. The **microphone** thus obtained is easy to wear and free to change its **shape** as needed.

DESCRIPTION OF DRAWING(S) - The figure is a cross-sectional view of the diaphragm-type **transducer** .

Substrate (100)
Lower protective layer (110)
Membrane layer (220)
Electrode layer (230, 250)
Active layer (240)
Connecting pad (271, 272)
pp; 18 DwgNo 3/8

Derwent Class: A14; A23; A26; A85; L03; Q68; U11; U12; V06; W01
International Patent Class (Main): B81B-003/00; B81C-001/00; G06G-007/18; H04R-017/02 ; H04R-031/00
International Patent Class (Additional): G06F-007/64; G06G-007/19; H01L-041/09; H01L-041/193; H01L-041/26
Technology Focus:
... Preferred Component: The **transducer** also includes a lower protective layer (110) coated on the substrate, and an upper protective...
...Preferred Property: The lower protective layer has a thickness of less than 10 microns. The **membrane** layer has a thickness of less than 5

microns. The electrode layers each has a...
...lower and upper protective layers are formed of either silicon nitride or silicon oxide. The **membrane** layer is formed of silicon nitride...
...either a high-molecular (polymeric) material consisting of polyimide, or a metallic thin film. The **piezo** -polymer comprised polyvinyl polyvinylidene fluoride (PVDF), PVDF-TrEF, TrEF, polyurea, polyimide, or Nylon(RTM).

10/7,K/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
008382842 **Image available**
WPI Acc No: 1990-269843/199036
Piezoelectric **transducer** capsule - includes **membrane** with elastic support also serving to seal capsule
Patent Assignee: HORLOG PHOTO FRANC (HORL-N)
Inventor: CAUSSE P; GRAHAM P; MAURY B; WALTER J C
Number of Countries: 015 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 385889	A	19900905	EP 90420099	A	19900223	199036	B
FR 2643772	A	19900831				199042	
CA 2010977	A	19900827				199046	
US 4978880	A	19901218	US 90484383	A	19900223	199102	

Priority Applications (No Type Date): FR 892931 A 19890227
Cited Patents: 2.Jnl.Ref; DE 2126556; GB 2128399; JP 60199298; JP 61029298; US 4295009
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 385889	A				

Designated States (Regional): AT BE CH DE ES GB GR IT LI LU NL SE
Abstract (Basic): EP 385889 A

The **piezo**electric capsule includes a hollow metal cover fitting on to a base which includes a printed circuit board. A **piezo**electric **membrane** (1) is designed to fit against an internal shoulder in the cover (8).

An elastic support element (22) is fixed to the base of the unit, and acts against the central area of the lower surface of the **membrane** . This provides mechanical support for the **membrane** , but also provides a seal, since it reaches to the **edges** and the shoulder surfaces are perfectly flat.

USE - Electroacoustic **transducer** . (12pp Dwg.No.2/6)

Abstract (Equivalent): US 4978880 A

A **piezo**electric capsule has a flat supporting surface and resilient holder. It comprises a hollow metal lid (8) fitted on a base body (7) formed of a printed circuit, and a **piezo**electric **membrane** (1) applied against a front step (17) of the lid (8). The resilient holder (22) is fixed to the base body (7) and bears on the central zone of the rear face (5) of the **membrane** (1). The resilient means (22) holds the **membrane** (1) mechanically in position and simultaneously provide peripheral sealing by the fact that the corresponding surface of the front step (17) and of the **membrane** (1) are perfectly flat.

USE/ADVANTAGE - **Transducer** . Good acoustic effect and size compromise. (9pp

Derwent Class: V06
International Patent Class (Additional): H01L-041/08; H04R-017/00 ;

```
  H04R-031/00

19/26,TI/12     (Item 12 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
009246709
WPI Acc No: 1992-374126/199246
  Ultrasonic  transducer  for echo sounding distance measurement - has
  damping material ring applied to oscillation membrane on side facing
  propagation medium

 19/26,TI/13     (Item 13 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
008005605
WPI Acc No: 1989-270717/198938
  Accelerometer for blast monitoring with piezoelectric membrane - has high
  to low impedance output converter and low pass filter

19/26,TI/25     (Item 25 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
001317422
WPI Acc No: 1975-L1345W/197541
  Amplifying appts. for guitar etc. - includes wooden resonance box having
  similar acoustical properties to guitar sound board

 19/34/1     (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
016496472     **Image available**
WPI Acc No: 2004-654418/200464
   Loudspeaker  has at least one membrane of tubular cross-section of
  circular or elliptical shape attached to drive at longitudinal edges
Patent Assignee: KOJER K (KOJE-I)
Number of Countries: 001  Number of Patents: 001
Patent Family:
Patent No     Kind   Date     Applicat No    Kind   Date      Week
DE 20319824    U1  20040909  DE U20319824    U    20031220  200464  B
Priority Applications (No Type Date): DE U20319824 U 20031220
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
DE 20319824    U1     3 H04R-007/00
Abstract (Basic): DE 20319824 U1
        NOVELTY - The  loudspeaker  has at least one  membrane  (1)
    attached to a drive (2) so as to be free to oscillate. The  membrane
    is of tubular cross-section of circular or elliptical  shape  and is
    attached to the drive at its longitudinal  edges . The drive is a
    crystal oscillator or  piezo  element flexural vibrator.
        USE - For sound reproduction.
        ADVANTAGE - The membrane is not moved with its entire weight but
    only with its spring force to set the air in motion.
        DESCRIPTION OF DRAWING(S) - The drawing shows a schematic
    representation of an arrangement of two membranes and a drive
        membranes (1)
        drive (2)
        pp; 3 DwgNo 1/1
Derwent Class: V06
International Patent Class (Main): H04R-007/00
International Patent Class (Additional): H04R-007/16;  H04R-017/00

19/34/3     (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
014099252     **Image available**
WPI Acc No: 2001-583466/200166
  Ultrasonic sensor has pot- shaped  vibration element whose floor acts as
  membrane  with at least two disc- shaped   piezoelectric   transducers
  attached to  membrane  and adjacent to each other
Patent Assignee: VOLKSWAGEN AG (VOLS  )
Inventor: FALZEWSKI D
Number of Countries: 092  Number of Patents: 004
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
DE 10009129     A1   20010830  DE 1009129       A   20000226  200166   B
WO 200163595    A1   20010830  WO 2001EP1075    A   20010201  200166
AU 200131697    A    20010903  AU 200131697     A   20010201  200202
EP 1173842      A1   20020123  EP 2001903687    A   20010201  200214
                               WO 2001EP1075    A   20010201
Priority Applications (No Type Date): DE 1009129 A 20000226
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
DE 10009129   A1      5 H04R-001/32
WO 200163595  A1 G     G10K-009/125
   Designated States (National): AE AG AL AM AU AZ BA BB BG BR BY BZ CA CN
   CR CU CZ DM DZ EE GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK
   LR LS LT LV MA MD MG MK MN MW MX MZ NO NZ PL RO RU SD SG SI SK SL TJ TM
   TR TT TZ UA UG US UZ VN YU ZA ZW
   Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU
   MC NL PT SE TR
AU 200131697  A        G10K-009/125  Based on patent WO 200163595
EP 1173842    A1 G     G10K-009/125  Based on patent WO 200163595
   Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT
   LI LT LU LV MC MK NL PT RO SE SI TR
Abstract (Basic): DE 10009129 A1
        NOVELTY - The sensor has a pot- shaped  vibration element (4) whose
    floor acts as a  membrane  with at least two disc- shaped
    piezoelectric   transducers  (6,7) attached to the  membrane  and
    adjacent to each other. The  piezoelectric   transducers  vibrate in
    parallel and in the same direction during the sensor transmission mode
    and there is an associated device for operating the  transducer
    separately.
        USE - Especially for parking aids in motor vehicles.
        ADVANTAGE - A sound-direction diagram with a high degree of
    asymmetry is achieved with a high level of efficiency and the sensor
    can be reproduced relatively simple, reliably and in large quantities.
        DESCRIPTION OF DRAWING(S) - The drawing shows a schematic sectional
    representation of an ultrasonic sensor
        pot-shaped vibration element (4)
        piezoelectric   transducers  (6,7)
        pp; 5 DwgNo 1/8
Derwent Class: P86; V06; W06
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International Patent Class (Main): G10K-009/125; H04R-001/32
International Patent Class (Additional): G01S-007/521; G01S-015/93; H04R-017/00

19/34/8 (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
011058700 **Image available**
WPI Acc No: 1997-036625/199704

Loudspeaker with piezoelectric diaphragm actioner - has cup shaped axially mounted diaphragm membrane with axially and lower position mounted piezoelectric sections

Patent Assignee: SILEC SOC IND LIAISONS ELECTRIQUES (SLIE)
Inventor: HOUSNI J
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
FR 2734685	A1	19961129	FR 956125	A	19950523	199704	B

Priority Applications (No Type Date): FR 956125 A 19950523
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
FR 2734685	A1		10	H04R-017/00	

Abstract (Basic): FR 2734685 A

The **loudspeaker** includes actioner is made up of **piezo**electric bars (39,45) mounted on the **loudspeaker membrane** (13) surface. The cup **shape**d **membrane** is held in an enclosure (1) with its outer rim secured to the enclosure.

The **piezo**electric bars are placed coaxially around the axis with the **loudspeaker membrane**, with a **piezo**electric disc placed at the base. Electrical activation vibrates the **piezo**electric sections thus activating the **membrane**, moving air and producing sounds.

USE/ADVANTAGE - **Piezo**electric based **loudspeaker** producing high level response at low and medium frequencies.

Dwg.2/3

Derwent Class: V06
International Patent Class (Main): H04R-017/00

19/34/9 (Item 9 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
010458982 **Image available**
WPI Acc No: 1995-360301/199547

Ultrasonic transducer with asymmetric radiation characteristic - has membrane with circular segment recess formed at edge of radiating surface for greater radiating field aperture angle in horizontal plane

Patent Assignee: ITT AUTOMOTIVE EURO GMBH (INTT); VALEO SCHALTER & SENSOREN GMBH (VALO)
Inventor: DOERR H; MATHES J; STUMPE R
Number of Countries: 005 Number of Patents: 007
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 678853	A2	19951025	EP 95105504	A	19950412	199547	B
DE 4413894	A1	19951026	DE 4413894	A	19940421	199548	
EP 678853	A3	19970521	EP 95105504	A	19950412	199731	
EP 678853	B1	20010718	EP 95105504	A	19950412	200142	
DE 59509415	G	20010823	DE 509415	A	19950412	200150	
			EP 95105504	A	19950412		

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ES 2158008      T3  20010901  EP 95105504      A    19950412  200161
DE 4413894      C2  20021212  DE 4413894       A    19940421  200301
Priority Applications (No Type Date): DE 4413894 A 19940421
Cited Patents: No-SR.Pub; DE 3441684; DE 3939387; DE 3941634; EP 308899; US
  4437032
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
EP 678853     A2 G   6 G10K-009/12
   Designated States (Regional): DE ES FR GB IT
DE 4413894    A1     5 H04R-001/32
EP 678853     A3       G10K-009/12
EP 678853     B1 G     G10K-009/12
   Designated States (Regional): DE ES FR GB IT
DE 59509415   G        G10K-009/12   Based on patent EP 678853
ES 2158008    T3       G10K-009/12   Based on patent EP 678853
DE 4413894    C2       H04R-001/32
Abstract (Basic): EP 678853 A
        The  transducer  is used as an electroacoustic flexure  transducer
    , with a  membrane  of a  piezoelectrically  inactive material, coupled
    to a  piezoelectric  plate, arranged centrally on the inside face of
    the  membrane . The opposing radiating surface of the  membrane  has at
    least one circular segment recess (7, 8) as its peripheral  edge .
        Pref the membrane is cap shaped with a cylindrical sidewall
    incorporating a peripheral groove (2) and a radiating front face with a
    pair of circular segment recesses at diametrically opposite points,
    with a depth which is sufficient to reach the level of the peripheral
    groove.
        USE - For automobile relative distance warning device.
        Dwg.2/4
Derwent Class: P86; S02; V06; W06; X22
International Patent Class (Main): G10K-009/12; H04R-001/32
International Patent Class (Additional): G10K-009/122; G10K-013/00;
  H01L-041/08; H04R-007/04;  H04R-017/00

 19/34/10     (Item 10 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
010238031     **Image available**
WPI Acc No: 1995-139288/199518
  Mid-range frequency  piezoelectric   loudspeaker  - which uses a dome-
  shaped   piezoelectric  actuator to drive a speaker  membrane  directly.
Patent Assignee: NASA US NAT AERO & SPACE ADMIN (USAS  )
Inventor: HELLBAUM R F; JALINK A; REGAN C R; ROHRBACH W W
Number of Countries: 001  Number of Patents: 001
Patent Family:
Patent No      Kind   Date     Applicat No    Kind   Date     Week
US N8326804     N    19950315  US 94326804     A    19941011  199518  B
Priority Applications (No Type Date): US 94326804 A 19941011
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
US N8326804   N     14 H04R-000/00
Abstract (Basic): US N8326804 N
        A  piezoelectric   loudspeaker  suitable for mid-range frequencies
    uses a dome- shaped   piezoelectric  actuator to drive a speaker
    membrane  directly. The dome- shaped  actuator is made from a reduced
    and internally biased oxygen wafer, and generates excursion of the apex
```

of the dome in the order of 0.02-0.05 inches when a rated drive voltage of 350 V rms is applied between the convex and the concave surfaces of the dome- **shape**d actuator. The load capacity exceeds 10 lbs. The **edge** of the rim of the dome- **shape**d actuator must be free to rock when the dome height varies to ensure low distortion in the **loudspeaker** . This is achieved by mounting the rim of the dome- **shape**d actuator on a support surface by prestress only. An exceptionally simple design uses a planar **speaker membrane** with the centre part of one side pressed against the rim of a dome- **shape**d actuator by prestress from a stretched latex surround member.

USE - **Piezo**electric **loudspeaker**s for sound reproduction, e.g. for use as direct coupled mid-range driver.

ADVANTAGE - Simple and rugged design; low distortion.

Dwg.1/5

US 8326804 N

A **piezo**electric **loudspeaker** suitable for mid-range frequencies uses a dome- **shape**d **piezo**electric actuator to drive a **speaker membrane** directly. The dome- **shape**d actuator is made from a reduced and internally biased oxygen wafer, and generates excursion of the apex of the dome in the order of 0.02-0.05 inches when a rated drive voltage of 350 V rms is applied between the convex and the concave surfaces of the dome- **shape**d actuator. The load capacity exceeds 10 lbs. The **edge** of the rim of the dome- **shape**d actuator must be free to rock when the dome height varies to ensure low distortion in the **loudspeaker** . This is achieved by mounting the rim of the dome- **shape**d actuator on a support surface by prestress only. An exceptionally simple design uses a planar **speaker membrane** with the centre part of one side pressed against the rim of a dome- **shape**d actuator by prestress from a stretched latex surround member.

USE - **Piezo**electric **loudspeaker**s for sound reproduction, e.g. for use as direct coupled mid-range driver.

ADVANTAGE - Simple and rugged design; low distortion.

Dwg.1/5

US 8326804 A

A **piezo**electric **loudspeaker** suitable for mid-range frequencies uses a dome- **shape**d **piezo**electric actuator to drive a **speaker membrane** directly. The dome- **shape**d actuator is made from a reduced and internally biased oxygen wafer, and generates excursion of the apex of the dome in the order of 0.02-0.05 inches when a rated drive voltage of 350 V rms is applied between the convex and the concave surfaces of the dome- **shape**d actuator. The load capacity exceeds 10 lbs. The **edge** of the rim of the dome- **shape**d actuator must be free to rock when the dome height varies to ensure low distortion in the **loudspeaker** . This is achieved by mounting the rim of the dome- **shape**d actuator on a support surface by prestress only. An exceptionally simple design uses a planar **speaker membrane** with the centre part of one side pressed against the rim of a dome- **shape**d actuator by prestress from a stretched latex surround member.

USE - **Piezo**electric **loudspeaker**s for sound reproduction, e.g. for use as direct coupled mid-range driver.

ADVANTAGE - Simple and rugged design; low distortion.

Dwg.1/5

Derwent Class: L03; V06
International Patent Class (Main): H04R-000/00

19/34/18 (Item 18 from file: 350)

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DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
003733311
WPI Acc No: 1983-729509/198332
  Piezoelectric transducer for telephone handset - has acoustic stop
  fitting around membrane peripheral edge
Patent Assignee: KASZYNSKI G (KASY-I); KASZYNSKI G (KASZ-I)
Inventor: KASZYNSKI G
Number of Countries: 001  Number of Patents: 002
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
DD 200342      A   19830413                                198332  B
DD 200342      B   19900829                                199105
Priority Applications (No Type Date): DD 233300 A 19810915
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
DD 200342     A     10
Abstract (Basic): DD 200342 A
        The transducer uses a relatively inflexible membrane plate having
    a piezoelectric layer on at least one side and which is stressed at its
    centre, the periphery of the membrane plate supported within the
    transducer housing via an acoustic stop in the form of a resilient
    foam ring. Pref. the housing is in two halves each with a number of
    openings for passage of the sound waves, with the foam ring lining the
    peripheral inside wall of the housing.
        Each housing half has a projecting column one of which is convex at
    the end and which act on opposite sides of the membrane plate. The
    transducer has a good signal/noise ratio and transmission factor its
    characteristic frequency being lowered.
        0/1
Derwent Class: V06; W01
International Patent Class (Additional): H04R-017/00

 19/34/22     (Item 22 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
002305598
WPI Acc No: 1980-B2031C/198006
  Electroacoustic transducer for telephone handset - has piezoelectric
  plate held between two elastic rings having ridges and projections for
  partial response equalisation
Patent Assignee: SIEMENS AG (SIEI )
Inventor: BOEHME W; MARTIN E; SCHIERL H
Number of Countries: 001  Number of Patents: 001
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
DE 2831326     A   19800131                                198006  B
Priority Applications (No Type Date): DE 2831326 A 19780717
Abstract (Basic): DE 2831326 A
        The electroacoustic transducer has its piezoelectric membrane
    -like plate held at its edge by two elastic components comprising
    rings. The rings have circular ridges (14, 15) at their inner/outer
    peripheries and point-like projections (16, 17) on their outer/inner
    peripheries.
        The circular ridges and point-like projections are located on both
    sides of each ring. The depth of the ridges and the height of the
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projections are roughly equal or alternatively the projections may be higher than the cuts are deep

Derwent Class: V06

International Patent Class (Additional): H04R-007/18; H04R-017/00

19/7,K/4 (Item 4 from file: 350)

DIALOG(R)File 350:Derwent WPIX

(c) 2004 Thomson Derwent. All rts. reserv.

013502514 **Image available**

WPI Acc No: 2000-674455/200066

Stringed musical instrument using **piezo**electric **transducers** and forming resonating drum by combination of **membrane** and ring

Patent Assignee: SWAN T M (SWAN-I)

Inventor: SWAN T M

Number of Countries: 002 Number of Patents: 003

Patent Family:

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Patent No     Kind   Date     Applicat No    Kind   Date     Week
GB 2348535     A    20001004  GB 997524       A   19990401  200066  B
GB 2348535     B    20010214  GB 997524       A   19990401  200110
US 6191346     B1   20010220  US 99337265     A   19990622  200112  N
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Priority Applications (No Type Date): GB 997524 A 19990401; US 99337265 A 19990622

Patent Details:

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Patent No  Kind Lan Pg   Main IPC    Filing Notes
GB 2348535    A      22 G10H-003/18
GB 2348535    B         G10H-003/18
US 6191346    B1        G10D-003/04
```

Abstract (Basic): GB 2348535 A

NOVELTY - The instrument has a means for securing the string ends and a bridge for supporting the strings. The bridge is supported by a **membrane** (302). At least one **piezo**electric **transducer** (403,404) is placed in physical contact with the **membrane**. The **transducers** are connected in parallel to a potentiometer (202) electrically matching the instrument output and typical amplifier input.

DETAILED DESCRIPTION - The instrument has a means for securing the string ends and a bridge for supporting the strings. The bridge is supported by a **membrane** (302). At least one **piezo**electric **transducer** (403,404) is placed in physical contact with the **membrane**. The **transducers** are connected in parallel to a potentiometer (202) electrically matching the instrument output and typical amplifier input. The **membrane** is secured at **edges** to a ring (405). The combination of the ring and the **membrane** produce a resonating drum. The resonating drum is retained within a well (406) cut into the instrument main body (101). A highly compressible sponge like material (407) can be introduced into the resonating drum so as to soften the overall timbre of the instrument. The **membrane** can be molded in combination with ring (405) to form the resonating drum. An INDEPENDENT CLAIM is also included for a method of producing the instrument having a securing means for securing the ends of the strings and a floating bridge for supporting the strings, comprising supporting a flexible sheet-like material within a housing for the instrument and placing at least one **transducer** in contact with the material such that it is held between the material and the floating bridge.

USE - For stringed musical acoustic instruments amplification.

ADVANTAGE - Such stringed musical instruments can be included into ensembles or groups with amplified instruments.

DESCRIPTION OF DRAWING(S) - The drawing shows the internal amplifying components of a banjo
Instrument body (101)
Potentiometer (202)
Membrane (302)
Transducers (403,404)
Ring (405)
Well (406)
Sponge like material (407)
pp; 22 DwgNo 4/6
Derwent Class: A32; A97; P86; V06; W04
International Patent Class (Main): G10D-003/04; G10H-003/18
International Patent Class (Additional): G10D-001/10

19/7,K/5 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
013145539 **Image available**
WPI Acc No: 2000-317411/200027
Speaker device for generating parametric audio output based on interaction of ultrasonic frequencies within air has **transducer** with stator element that are based on film typed diaphragms
Patent Assignee: AMERICAN TECHNOLOGY CORP (AMTE-N)
Inventor: CROFT J J; KHURI-YAKUB P; NORRIS E G; SELFRIDGE A R
Number of Countries: 087 Number of Patents: 006
Patent Family:

```
Patent No      Kind   Date     Applicat No    Kind   Date      Week
WO 200018182    A1   20000330  WO 99US19580    A   19990826  200027  B
AU 9959020      A    20000410  AU 9959020      A   19990826  200035
EP 1123634      A1   20010816  EP 99946657     A   19990826  200147
                               WO 99US19580    A   19990826
BR 9913954      A    20020213  BR 9913954      A   19990826  200220
                               WO 99US19580    A   19990826
CN 1331901      A    20020116  CN 99812680     A   19990826  200230
JP 2002526004   W    20020813  WO 99US19580    A   19990826  200267
                               JP 2000571709   A   19990826
```

Priority Applications (No Type Date): US 98159442 A 19980924
Patent Details:

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Patent No   Kind Lan Pg   Main IPC     Filing Notes
WO 200018182   A1 E  90 H04R-003/00
   Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN
   CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ
   LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK
   SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
   Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR
   IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW
AU 9959020     A        H04R-003/00   Based on patent WO 200018182
EP 1123634     A1 E     H04R-003/00   Based on patent WO 200018182
   Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT
   LI LT LU LV MC MK NL PT RO SE SI
BR 9913954     A        H04R-003/00   Based on patent WO 200018182
CN 1331901     A        H04R-003/00
JP 2002526004 W      84 H04R-003/00   Based on patent WO 200018182
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Abstract (Basic): WO 200018182 A1

NOVELTY - A **speaker** device for generating parametric audio output has a parametric signal generation system for generating at least two electronic signals, an electro-acoustical film **transducer** diaphragm (33); and a support structure or stator (31) for positioning and stabilizing the diaphragm.

DETAILED DESCRIPTION - The **speaker** device for generating parametric audio output based on interaction of multiple ultrasonic frequencies with air as a nonlinear medium has a parametric signal generation system for generating at least two electronic signals; an electro-acoustical film **transducer** diaphragm; and a support structure for positioning and stabilizing the diaphragm. The parametric signal generation system includes an ultrasonic signal source, an audio signal source and a modulating device coupled to the ultrasonic and audio signal sources for mixing the ultrasonic and audio signals. INDEPENDENT CLAIMS are also included for (A) a method for generating parametric audio output based on the multiple ultrasonic frequencies within air as a nonlinear medium by generating an electronic signal of at least two ultrasonic signals having different value of frequency, transferring the signal to an electro-acoustical film **transducer** diaphragm which couples directly with the air, converting the electronic signal at the diaphragm directly to mechanical displacement, and mechanically emitting the two ultrasonic signals from the diaphragm into the air as ultrasonic compression waves; (B) a system for indirectly generating at least one new sonic or subsonic frequency from at least two ultrasonic frequencies of two different values has a hollow drum having a sidewall and a two opposing ends, an emitter plate is attached to the first end of the drum having several apertures extending from the inner face to the outer face, a back cover coupled to second end of the drum, an electrically **membrane** disposed on the emitter plate over the apertures, a pressure device used to applied the emitter plate and the **membrane** for distending the **membrane** at the apertures into an accurate emitter configuration, and a conductive **perimeter** ring is coupled to the **piezo**electric film for providing electrical input; (C) an emitter for generating audio output from ultrasonic emission into the air having a flexible **piezo**electric **membrane** with several accurate emitter configuration disposed across the surface of the **membrane** and configured to respond to an electrical signal corresponding to an ultrasonic frequency for generating ultrasonic compression waves into the air; (D) a parametric **speaker** with a support plate and a thin **piezo**electric film having an ultrasonic emitter array for emitting ultrasonic compression waves into a nonlinear air medium; and (E) an emitter device for generating parametric audio output based on an interaction of multiple ultrasonic frequencies has a core member, a movable diaphragm extending along the core member, at least one, low mass, planar, conductive coil disposed on the movable diaphragm and a conductive ring for supplying variable current flow to at least one coil for developing a second magnetic field that interact with the first magnetic field to attract and repel the diaphragm at a desired frequency.

USE - For generating parametric audio output.

ADVANTAGE - The **transducer** diaphragm is capable of generating high amplitude compression waves in response to electrical stimulation, which does not require a rigid diaphragm structure of conventional audio **speakers** or ultrasonic **transducers** . It can deliver a high output while minimizing distortion, phase shift, and harmonic resonances. The plate is capable of operating in single or push or pull configuration.

DESCRIPTION OF DRAWING(S) - The figure shows a drawing of a

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    sinusoidal shaped piezo film with a backplate and a curvature to open
    up the directivity angle of the primary frequencies.
        Stator (31)
        Electro-acoustical film  transducer  diaphragm (33)
        pp; 90 DwgNo 4b/32
Derwent Class: A85; V06
International Patent Class (Main): H04R-003/00
International Patent Class (Additional): H04R-007/02;  H04R-017/00 ;
  H04R-019/02;  H04R-025/00
Extension Abstract:
...        In an EMBODIMENT of the device, the  transducer  diaphragm is a
    monolithic sheet of film having closely spaced concave dimples in
    closely spaced...
...radiation pattern for emission of the parametric output across the
    surface of the diaphragm. The  transducer  diaphragm is supported at
    the backplate with a sinusoidal configuration. The accurate emitter
    sections are...

19/7,K/7     (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
012423247     **Image available**
WPI Acc No: 1999-229355/199919
  Electromechanical acoustic  transducers , electric motors, and
  three-dimensional video displays employing aerogel
Patent Assignee: 1 IPR LTD (ONEI-N)
Inventor: FOREST L; HOOLEY A; PEARCE D H
Number of Countries: 083  Number of Patents: 005
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
WO 9913681      A2  19990318  WO 98GB2675       A   19980904  199919  B
AU 9889918      A   19990329  AU 9889918        A   19980904  199932
EP 1012891      A2  20000628  EP 98941601       A   19980904  200035
                              WO 98GB2675       A   19980904
JP 2001517004   W   20011002  WO 98GB2675       A   19980904  200172
                              JP 2000511333     A   19980904
US 6677034      B1  20040113  WO 98GB2675       A   19980904  200405
                              US 2000508009     A   20000306
Priority Applications (No Type Date): GB 985735 A 19980319; GB 9718785 A
  19970905; GB 985053 A 19980311
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
WO 9913681    A2 E  45 H04R-000/00
   Designated States (National): AL AM AT AU AZ BA BB BG BR BY CA CH CN CU
   CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR
   LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM
   TR TT UA UG US UZ VN YU ZW
   Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR
   IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
AU 9889918    A                      Based on patent WO 9913681
EP 1012891    A2 E     H01L-041/09   Based on patent WO 9913681
   Designated States (Regional): AT BE CH CY DE DK ES FI FR GR IE IT LI LU
   MC NL PT SE
JP 2001517004 W    127 H04R-001/02   Based on patent WO 9913681
US 6677034    B1       B32B-005/16   Based on patent WO 9913681
Abstract (Basic): WO 9913681 A2
```

NOVELTY - Claims are made for several devices all employing an aerogel as an essential operational element. Devices included are: an electromechanical acoustic **transducer** (5); sound absorbing material; a moving magnet **transducer** ; a form of three-dimensional video display. The aerogel is formed from silica, polyurethane, or rubber, treated depending upon the application. Its pore size is of the order of nanometres.

DETAILED DESCRIPTION - CLAIMS INCLUDE: Electromechanical acoustic **transducer** (5) is resistively terminated at the rear with a block (7) of aerogel sound absorber, sealed within a gas-impermeable but acoustically transparent **membrane** and filled with a gas chosen so as to optimize matching the acoustic resistance of the aerogel to the radiation resistance of the **transducer** and/or sound absorption from the rear. Absorber of sound energy is an aerogel composed of rough-surfaced particles having spherical, cylindrical, or irregular **shapes** produced by crushing larger particles or monoliths. The particles are 0.5 - 20 mm across and are slightly bonded with adhesive. The sound absorber is especially composed of multiple layers (17A,17B,....) of aerogel having graded properties in the principal direction of the sound and is prefilled with a gas with relevant properties different from air. Moving magnet **transducer** has piston composed of a magnetically doped non-magnetic-aerogel or intrinsically magnetic-aerogel suspended in a controllable magnetic field and supported by a linear bearing such as the subject of Hooley British Patent Application No. 2,322,232 The piston has a skin of gas-impervious material and the air is at least partially evacuated from the aerogel. The same principle may be used to provide a rotary electric motor mounted on rotary bearings. A three-dimensional video display utilizes a block of transparent aerogel that can be caused to glow when scanned internally by two or more intersecting laser beams. INDEPENDENT CLAIMS are included for **piezo**electric devices for use as electromechanical drivers, especially with integral positioning and control mechanisms, and **piezo**electric print heads. The electromechanical driver is a unimorph or bimorph **piezo**electric 'bender', formed into a flat-wound helix and polarized in the thickness direction. Electrodes are deposited on opposite sides of the flat helix and the bender moves axially when an electrical signal is applied. The print head has a channeled **piezo**electric device formed by extruding a **piezo**electric ceramic paste, plasticizer, and a material which becomes electrically conductive after sintering. The composition is fired to form a conductive electrode layer on the surfaces of its channel walls. When an electrically signal is applied, the device acts as a pumping device.

USE - Aerogels for stand alone sound absorbers and sound absorbers for electromechanical acoustic **transducers** , **transducer** drive elements, and visible-image-forming devices and **piezo**electric devices for use as electromechanical drivers and ink-jet print heads.

DESCRIPTION OF DRAWING(S) - The figure shows a section through a **loudspeaker** having a sound-absorbing aerogel plug and a graded aerogel suitable for use as the plug.

transducer (5)
aerogel block (7)
gas impermeable **membrane** (8)
multiple layers. (17A,17B,...)
pp; 45 DwgNo 1A,1B/9

Derwent Class: A85; L03; P73; P75; Q57; Q62; V06

International Patent Class (Main): B32B-005/16; H01L-041/09; H04R-000/00 ; H04R-001/02
International Patent Class (Additional): B41J-002/045; B41J-002/055; B41J-002/16; G09F-009/00; G10K-011/162; H04N-013/04; H04R-001/28; H04R-017/00

19/7,K/11 (Item 11 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
009769552 **Image available**
WPI Acc No: 1994-049403/199407

Interdigital **transducer** for use in a surface acoustic wave **filter** - has thin film of metal pattern on **piezo**electric substrate which is **shaped** to **transducer** has two bus-bars with series of electrodes.

Patent Assignee: COM DEV LTD (COMC-N)
Inventor: PEACH R C
Number of Countries: 002 Number of Patents: 003
Patent Family:

```
Patent No     Kind   Date      Applicat No    Kind   Date      Week
CA 2069370     A   19931126  CA 2069370      A   19920525  199407  B
US 5345135     A   19940906  US 9310072      A   19930126  199435
CA 2069370     C   19951205  CA 2069370      A   19920525  199610
```

Priority Applications (No Type Date): CA 2069370 A 19920525
Patent Details:

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Patent No  Kind Lan Pg   Main IPC    Filing Notes
CA 2069370   A       13 H04R-017/00
US 5345135   A        4 H01L-041/08
CA 2069370   C          H04R-017/00
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Abstract (Basic): CA 2069370 A

Transducer comprises a thin-film of metal pattern on a **piezo**electric substrate, the pattern being **shape**d so that the **transducer** has two bushes with a series of electrodes between the busbars. The electrodes are parallel to one another, each electrode having a break, the **transducer** being imparted within the **filter** so that when voltage is applied across the busbars, electric fields between the electrodes generate surface acoustic waves. Each busbar has an inner and an outer **edge** , the inner **edge** extending between each of the electrodes, the outer **edge** having outermost portions, all outermost portions being parallel to the inner **edge** . The inner and outer **edge**s have a non-linear **shape** and are **shape**d relative to one another to reduce the effect of internally reflected surface waves. Pref. the two busbars have an identical **shape** . The number of electrodes is equal to NH where N is an integer greater than zero. The outer and inner **edge**s have a random **shape** throughout the length of each busbar so that the distance between the outermost portion and the inner **edge** is contact. The busbars have a random pattern that is repeated throughout the length. The substrate is selected from quartz, Li, niobate, or Li tantalate and the metal pattern is formed of Al. The busbars are **shape**d so that the distance between the outermost portion of the outer **edge** and the inner **edge** varies.

(Dwg.1/4)

Abstract (Equivalent): US 5345135 A

An interdigital **transducer** for use in a surface acoustic wave **filter** , comprises a thin film of metal pattern on a **piezo**electric substrate. The pattern is **shape**d so that the **transducer** has two busbars with electrodes extending between the busbars. The electrodes are parallel to one another, each electrode having a break. The **transducer** is connected within the **filter** so that when voltage is applied across the busbars, electric fields between the electrodes generate surface acoustic waves. Each busbar has an inner **edge** and an outer **edge** . The inner **edge** extends between each of the electrodes. The outer **edge** has outer-most portions which are parallel to the inner **edge** . The inner and outer **edges** have a non-linear **shape** in the form of a pattern and are **shaped** relative to one another to reduce the effect of internally reflected surface waves. The pattern is repeated throughout the **filter** .

USE - The **transducer** is esp. useful in a surface acoustic wave **filter**.

Dwg.0/4

Derwent Class: L03; U14; V06
International Patent Class (Main): H01L-041/08; H04R-017/00
International Patent Class (Additional): H03H-009/64

19/7,K/14 (Item 14 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
007900705 **Image available**
WPI Acc No: 1989-165817/198922

Electro-acoustic **transducer** with **piezo**electric element - has oscillating **membrane** coupled to carrier via intermediate transmission elements

Patent Assignee: FISCHER R (FISC-I)
Inventor: FISCHER R
Number of Countries: 014 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 8904582	A	19890518	WO 88DE700	A	19881110	198922	B
DE 3738325	A	19890601				198923	
AU 8825498	A	19890601				198934	
DE 3738325	C	19900705				199027	

Priority Applications (No Type Date): DE 3738325 A 19871111
Cited Patents: DE 2253159; DE 3620557; EP 63094; FR 2419642; US 2735024; US 4525645
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 8904582	A	G	18		

Designated States (National): AU JP SU US
Designated States (Regional): AT BE CH DE FR GB IT LU NL SE

Abstract (Basic): WO 8904582 A

The **transducer** has a **piezo**electric element (5) supported by a transmission element (6) and an oscillating **membrane** (1). The two ends of the transmission element (6) facing away from the **piezo**electric element (5) are coupled to the **membrane** (1) and a carrier (3), with an angle between the transmission element (6) and the **membrane** (1) where they are joined together. The **membrane** (1) may extend at right angles to the transmission element (6) and it is pref. secured to the carrier (3) via a number of equi-angularly spaced transmission elements (6) around its periphery, both the **membrane** (1) and the carrier (3) having a circular or oral **shape** .

ADVANTAGE - Eliminates low frequency resonance between 3 and 5 kHg.

1/7

Derwent Class: V06

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International Patent Class (Additional): H04R-017/00

 19/7,K/15     (Item 15 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
007437628     **Image available**
WPI Acc No: 1988-071563/198811
  Piezo-ceramic  transducer  e.g. for audio range - has annular groove,
  positioned close to ceramic disc periphery, and mounting ring of plastics
  material
Patent Assignee: STETTNER & CO (STET-N)
Inventor: BERTL G
Number of Countries: 015  Number of Patents: 004
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
DE 3629093      A   19880310  DE 3629093       A   19860827  198811  B
EP 264557       A   19880427  EP 87111434      A   19870807  198817
JP 63067900     A   19880326  JP 87207344      A   19870820  198818
KR 9006323      B   19900828                                 199144
Priority Applications (No Type Date): DE 3629093 A 19860827
Cited Patents: A3...8949; DE 1112548; FR 854121; No-SR.Pub; US 4449019
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
DE 3629093    A      3
EP 264557     A  G
   Designated States (Regional): AT BE CH DE ES FR GB GR IT LI LU NL SE
Abstract (Basic): DE 3629093 A
        The  piezo -ceramic  transducer  includes a metal  membrane  (2)
    with a centre mounted ceramic disc (3) and a ring- shaped  groove (4)
    running concentrically around its surface. The annular groove may be
    positioned close to the periphery of the ceramic disc (3) or further
    away from the disc, even as far out as the inner  edge  (8) of the
    membrane  mounting ring (9).
        The mounting ring is made of a plastics material and is moulded
    onto the outer peripheral edge of the metal membrane during the course
    of the injection moulding process.
        USE/ADVANTAGE - Piezo-ceramic acoustic  transducer  for speech
    systems. Improved quality of speech playback and intermittent tones.
        1,2/2
Derwent Class: V06
International Patent Class (Additional): H04R-017/00

 19/7,K/16     (Item 16 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
004552841
WPI Acc No: 1986-056185/198609
   Microphone  insert for telephone subscriber's appts. - incorporates
  edge-clamped piezoelectric disc above PCB carrying amplifier
Patent Assignee: FERNSPRECH & SIGN (FERN-N)
Inventor: ETZRODT H; SCHMIDT K J
Number of Countries: 001  Number of Patents: 002
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
DE 3425176      A   19860220  DE 3425176       A   19840709  198609  B
DE 3425176      C   19890316                                 198911
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Priority Applications (No Type Date): DE 3425176 A 19840709
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
DE 3425176    A     15
Abstract (Basic): DE 3425176 C
        The piezoelectric  microphone  capsule is used in a telephone
    handset. It incorporates a support body (24) forming a ring to support
    the  edge  of the piezoelectric  membrane  (21). There are bearing
    rings (22,23) grasping the  edge  of the disc and a front plate fits
    over the disc and presses the bearing rings together.
        There is a cup- shaped  metal housing (2) surrounding the support
    body, and a cup- shaped  lid (4) fits over it, with a clamping disc
    (19) pressing against the front plate to hold the  piezoelectric
    membrane  in position. There is a conductor plate (34) underneath the
    piezoelectric  membrane , connected to the metal housing by a metal
    contact strip (60). It connects the output of an amplifier circuit to
    earth.
        ADVANTAGE - Constant electrical connection between conductor plate
    and electrically conducting housing of capsule.
        (15pp Dwg.No.12/15
Derwent Class: V06; W01
International Patent Class (Additional): H04R-001/06;  H04R-017/02

19/7,K/17     (Item 17 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
004192196
WPI Acc No: 1985-019076/198504
   Piezoelectric  microphone  for telephone set in noisy environment - has
   piezo -disc and  membrane  between tops of mirror image hat- shaped
  supports
Patent Assignee: INST NACHRICHTENTECHNIK BERLIN (NACK  ); ALCATEL SEL RFT
  GMBH (ALCA-N)
Inventor: ANDRES G; DIETRICH W; WICKERT G
Number of Countries: 001  Number of Patents: 002
Patent Family:
Patent No     Kind   Date     Applicat No    Kind   Date     Week
DD 213808      A    19840919  DD 248476       A    19830304  198504  B
DD 213808      B5   19931223  DD 248476       A    19830304  199404
Priority Applications (No Type Date): DD 248476 A 19830304
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
DD 213808     A     12
DD 213808     B5       H04R-017/00
Abstract (Basic): DD 213808 A
        The microphone  has a  piezoelectric  layer on a  membrane  inside
    a casing. The  membrane  is suspended at its centre springily between
    two columns that also act as contacts. The columns are formed by the
    curvature of two hat- shaped  parts that have their tops facing one
    another with the  membrane  (1) and its  piezoelectric  disc between.
        The columns are separated at their edges by at least one insulating
    ring acting as spacer. The brim of each hat has holes distributed
    regularly over it.
        ADVANTAGE - Simplicity and uniformity. The devices for centering
    the membrane's clamping and to form the sound cavity on each side of
    the membrane are largely identical and consist of as few parts as
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possible.
0/3
Derwent Class: V06; W01
International Patent Class (Main): H04R-017/00

19/7,K/19 (Item 19 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
003321648
WPI Acc No: 1982-G9662E/198224
Spherical **loudspeaker** with **piezo**-polymer **membrane** - varying in size in accordance with supplied signal
Patent Assignee: LICENTIA PATENT-VERW GMBH (LICN)
Inventor: THIELE K
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 3041684	A	19820609				198224	B

Priority Applications (No Type Date): DE 3041684 A 19801105
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 3041684	A		6		

Abstract (Basic): DE 3041684 A

The **loudspeaker** has a spherical **membrane** (1,2) acted on from the inside by a surface force (F). The **membrane** (1,2) comprises a **piezo**-polymer foil with a **piezo**electrically controlled thickness. It may be formed from a number of partial joined to an adjacent surface at all points around its periphery. The surface force (F) acting on the **membrane** (1,2) may be provided pneumatically.

Pref. the spherical **membrane** (1,2) comprises a number of segments each comprising a **piezo** -polymer foil (3) coated with a conductive layer (4,5) on both sides, with conductive strips (6,7) applied to the **edges** of the abutting segments on both the inside and the outside. The **loudspeaker** provides all-round sound whatever the **shape** of the room.

Derwent Class: V06
International Patent Class (Additional): H04R-017/00

19/7,K/20 (Item 20 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
003112632
WPI Acc No: 1981-M2681D/198148
Annular **membrane** -type **piezo**electric **loudspeaker** - has **shaped** annular concentric rings to increase sound energy and broaden radiation cone
Patent Assignee: CONG-THE H (CONG-I)
Inventor: CONTHE H
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
FR 2481040	A	19811023				198148	B

Priority Applications (No Type Date): FR 808957 A 19800418
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
FR 2481040	A		3		

Abstract (Basic): FR 2481040 A

The appts. consist of a domed **membrane** whose radius of curvature changes in response to the voltage applied to the two surfaces. Because of the small active area the acoustic energy radiated is small and directional. In increasing the active area by having a series of concentric **membranes** the energy is increased and the radiation field is widened.

The surfaces of the **membranes** are calculated depending on the sound levels desired and the ionic surfaces tangential to the apex are arranged so that the outer rings spread the cone of sound radiation from the central dome. The **membranes** may be constructed from a single piece and are held by their **edges** by a framework on one face and by **shaped** washers on the other, which preserve the geometry of the arrangement and are themselves screwed or fastened to the framework.

Derwent Class: V06
International Patent Class (Additional): H04R-017/00

19/7,K/21 (Item 21 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
002383833
WPI Acc No: 1980-K0303C/198042

Microphone with adjustable frequency response - has elastic support on front of **piezo**electric **membrane** allowing vol. behind to be adjusted

Patent Assignee: SENNHEISER ELECTRONIC (SENN-N)
Inventor: RUTSCHKE W
Number of Countries: 001 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2911917	A	19801009				198042	B
DE 2911917	C	19830811				198333	

Priority Applications (No Type Date): DE 2911917 A 19790327
Abstract (Basic): DE 2911917 A

The **microphone** has a **piezo**electric **membrane** held by an elastic support (8). The support is located in front of the **membrane** (6) when viewed from the direction of the incident sound so that the space (10) delineated by the rear of the **membrane** and ain intermediate plate can be adjusted to alter the characteristics. The intermediate plate (2) conforms to the **shape** of the **membrane** .

The elastic support may be a ring. Sound holes (9) are located in that part of the support adjoining the casing.

The advantage lies in being able to select the **microphone** 's frequency response independently of the constructional parts of the **microphone** .

Derwent Class: V06
International Patent Class (Additional): H04R-001/28; H04R-017/00

19/7,K/23 (Item 23 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
002301207
WPI Acc No: 1980-A7639C/198004

Electroacoustic **transducer** for e.g. telephone handset - has resonating **membrane** with **piezo**electric layer with damping of fourth order oscillations

Patent Assignee: SIEMENS AG (SIEI)

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Inventor: WALLISER K
Number of Countries: 010  Number of Patents: 005
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
EP 7036        A   19800123                                198004   B
GB 2025732     A   19800123                                198004
DE 2831362     A   19800131                                198006
BR 7904528     A   19800408                                198017
ZA 7903578     A   19800526                                198030
Priority Applications (No Type Date): DE 2831362 A 19780717
Cited Patents: DE 1299724; DE 1948932; DE 2318027; US 3746898; US 3846650
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
EP 7036       A  G
   Designated States (Regional): AT CH DE FR IT NL SE
Abstract (Basic): EP 7036 A
        The electroacoustic  transducer  has a flexible  membrane  secured
    around its  edges  and carrying a  piezo  electric layer. The  membrane
     provides a resonance peak adjacent the inherent oscillation of the
    membrane  and a number of higher order oscillations, for transmitting
    selected frequencies.
        The fourth order oscillation is shifted beyond the normal frequency
    range for telephone traffic into a higher frequency range, by
    increasing the thickness of the membrane coating it with a oscillation
    damping plastics layer, varying its peripheral configuration etc
Derwent Class: V06; W04
International Patent Class (Additional): H04R-001/22; H04R-001/28; H04R-017/00

19/7,K/24     (Item 24 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
002168601
WPI Acc No: 1979-J8548B/197942
  Linear response piezoelectric  loudspeaker  - has piezoelectric disc with
  damping ring between two ring nodes generated by first harmonic
Patent Assignee: MATSUSHITA ELEC IND CO LTD (MATU  )
Inventor: NAKAJIMA S
Number of Countries: 004  Number of Patents: 006
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
DE 2913957     A   19791011                                197942   B
GB 2018548     A   19791017                                197942
DE 2913957     B   19810702                                198128
US 4283605     A   19810811                                198135
GB 2018548     B   19820616                                198224
CA 1124830     A   19820601                                198225
Priority Applications (No Type Date): JP 78135585 A 19781101; JP 7846203 A
  19780407; JP 78U46203 U 19780407; JP 78U74642 U 19780531
Abstract (Basic): DE 2913957 A
        The  piezoelectric   loudspeaker  consists of a  piezoelectric
    disc (1) vibrating so as to produce concentric rings of nodes and
    mounted via a block (5) at its centre to the dish- shaped  casing (4)
    whose rim supports the outer  edge  of the conical  membrane  (3).
        A damping ring (2) is attached to the upper surface of the disc and
    is located between two node rings (first harmonic). The damping ring
    lies around the place at the centre of the disc where the membrane's
```

apex joins the disc
Derwent Class: V06; W04
International Patent Class (Additional): H04R-001/28; H04R-017/00

19/7,K/26 (Item 26 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
001307738
WPI Acc No: 1975-K1659W/197537
Electro-acoustic **transducer** using **piezo**electric **membrane** - **membrane** stretched over saddle **shape**d frame very low mechanical impedance
Patent Assignee: PIONEER RES ELEC (PIOE)
Number of Countries: 003 Number of Patents: 005
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2508556	A	19750904				197537	B
US 4008408	A	19770215				197708	
GB 1504408	A	19780322				197812	
US 4088915	A	19780509				197826	
DE 2508556	C	19850711				198529	

Priority Applications (No Type Date): JP 7422866 A 19740228
Abstract (Basic): DE 2508556 A

An electro acoustic **transducer** using a **piezo** electric **membrane** mounted on a saddle **shape**d frame is presented. Two traditional constructions of such devices are described. Basically a thin leaf of **piezo** -electric material of high molecular weight, such as polyvinylfluoride, is stretched over a hard rectangular metal frame. This frame, while basically rectangular, is bent into either a convex or saddle **shape**d form so that the **membrane** is stretched but not in one plane. If a current signal is then passed through the **membrane** , it contracts and expands and the non-plenar configuration of the **membrane** ensures that a deflection occurs at right angles to its surface. An acoustic signal is thus produced.

Derwent Class: U12; V06
International Patent Class (Additional): H01L-041/08; H04R-017/00

19/7,K/27 (Item 27 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
001296747
WPI Acc No: 1975-J0664W/197532
Piezo-electric or resistive acoustic **transducer** - has active plate secured across nodal line of oscillatory **membrane**
Patent Assignee: SIEMENS AG (SIEI)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
GB 1402352	A	19750806				197532	B

Priority Applications (No Type Date): DE 2202254 A 19720118
Abstract (Basic): GB 1402352 A

The electro-acoustic **transducer** has a **membrane** which is fixed in its **edge** region. The **membrane** includes on at least part of its oscillatory surface, in a position to extend on both sides of a nodal line characteristic of a resonant frequency of the **membrane** , at least one **piezo**electric or **piezo** -resistive ceramic plate. The **shape** of the electrically active area of the **piezo**electric plate is such that

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    in the region of the resonance frequency the frequency response of the
    transducer  deviates from frequency dependent behavrious of the
    membrane . The electrically active area may be in the  shape  of a ring
    when a circular  membrane  is used.
Derwent Class: V06; W04
International Patent Class (Additional): H04R-001/22;  H04R-017/02

 19/7,K/28     (Item 28 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
001223246
WPI Acc No: 1975-A7019W/197503
  Piezoelectric  transducer  for sound waves - has glued membrane to plate
  wedge for simplification
Patent Assignee: INST NAHRICHTENTECHNIK (NACH-N)
Number of Countries: 001  Number of Patents: 001
Patent Family:
Patent No     Kind   Date     Applicat No    Kind   Date     Week
SU 419069      A    19740827                                197503  B
Priority Applications (No Type Date): SU 1648773 A 19710426
Abstract (Basic): SU 419069 A
        Copper foil (4) is placed between two  piezoelectric  plates (1,
    2). One end of it is fixed in the holder (3), the other end carries a
    V- shaped  blade (5). The wedge end is placed at some distance from a
    membrane  (6). Then the wedge and  membrane  are fixed together by
    glue. The  transducer  can be used as receiver and generator of sonic
    waves.
Derwent Class: V06
International Patent Class (Additional):  H04R-017/00

 19/7,K/29     (Item 29 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
000781101
WPI Acc No: 1971-22749S/197113
  Pre-stressed audio frequency piezoelectric -  transducer
Patent Assignee: MOTOROLA INC (MOTI  )
Number of Countries: 003  Number of Patents: 003
Patent Family:
Patent No     Kind   Date     Applicat No    Kind   Date     Week
NL 7014052     A                                            197113  B
DE 2046901     A                                            197117
US 3588552     A                                            197128
Priority Applications (No Type Date): US 69860218 A 19690923
Abstract (Basic): NL 7014052 A
        A  piezoelectric  audio frequency  transducer  particularly for
    direct use as its own air-loaded  membrane  for coupling accoustic
    signals with air, has a frame with an opening of pre-determined
    transverse dimension, on which a thin  piezoelectric  ceramic plate is
    fixed, with the improvement whereby the frame has an axis in a plane
    parallel to the plane of the opening and is relatively robust in this
    plane to maintain its pre-determined dimensions, while being able to
    carry out torsional movements around its axis; the thin  piezoelectric
    ceramic plate can operate in the expansion mode, has a  shape
    corresponding to the frame opening and is curved along at least one of
    its principal dimensions to a lesser extent than its elastic limit,
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while its **edges** fit the frame opening and a conducting layer is applied to at least a part of each of its oppositely situated main faces, to produce a pair of oppositely place electrodes thereon.. A layer of plastics specif. Mylar (RTM) may be applied to the thin plate, the thickness of the plastics layer being much less than that of the plate.

Derwent Class: A23; A85; U25; V06
International Patent Class (Additional): H03H-009/06; H04R-017/00

20/26,TI/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
014401599
WPI Acc No: 2002-222302/200228

Piezoelectric **transducer** for touch panel, has polarization axis inclined to thickness direction of **piezo**electric substrate, to excite surface acoustic wave in single direction

20/26,TI/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
011647145
WPI Acc No: 1998-064053/199807

Ultrasonic **transducer** with contact member esp. for vehicle distance/ranging warning system - has contact springs connected to **piezo**electric disk or oscillating element and to connection lines

20/26,TI/5 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
010375514
WPI Acc No: 1995-276828/199537

Piezoelectric -electrostrictive film element for actuator or sensor e.g shock sensors - has porosity of dense body and deflection percentage of diaphragm portion which are related by given equation

20/26,TI/6 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
010152547
WPI Acc No: 1995-053799/199508

Soft **membrane** ultrasonic **transducer** for non-destructive testing - has **membrane** containing fluid which compresses to fit against surface of item to be tested, e.g. metal pipe

20/26,TI/7 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
009857735
WPI Acc No: 1994-137591/199417

Monochromatic ultrasound **transducer** for generating or detecting ultrasonic energy - has **filter** in solid medium for **filter**ing all frequencies except frequencies in narrow band centred on predetermined frequency

20/26,TI/9 (Item 9 from file: 350)
DIALOG(R)File 350:Derwent WPIX

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(c) 2004  Thomson Derwent. All rts. reserv.
008158846
WPI Acc No: 1990-045847/199007
  Ultrasonic  transducer  for vehicle distance warning device - has damping
  bung between outside wall of oscillation element and inside wall of
  reception chamber

20/26,TI/11     (Item 11 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
007688913
WPI Acc No: 1988-322845/198845
   Transducer  for sonic pulse transmission fluid flowmeter - has metal cup
  form with  membrane  base and associated electrode, and annular wall
  filled with damping material

 20/26,TI/13     (Item 13 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
004617294
WPI Acc No: 1986-120638/198619
  Electro-acoustic  transducer  for  microphone  in telephone handset -
  combines acoustic  filter  function with connections to PCB, with latter
  having recess into which  piezoelectric  diaphragm spacer is fitted

20/26,TI/15     (Item 15 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
003052153
WPI Acc No: 1981-F2185D/198123
   Piezoelectric   transducer  for e.g. ultrasonic generator - has
  superposed polymer layers with one or more metal coatings to provide
  enhanced capacitance

20/7,K/2     (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
014242756     **Image available**
WPI Acc No: 2002-063456/200209
Integrated  piezoelectric /electrostrictive film type element used as, e.g.
transducer , has controlled heterophase-occurrence rate at its surface
Patent Assignee: NGK INSULATORS LTD (NIGA  )
Inventor: KIMURA K; NANATAKI Y; TAKAHASI M; TAKEUCHI Y; NANATAKI T;
  TAKAHASHI M
Number of Countries: 028  Number of Patents: 006
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
EP 1148561      A2   20011024  EP 2001303594    A   20010419  200209  B
US 20020014816  A1   20020207  US 2001837546    A   20010418  200213
JP 2002009359   A    20020111  JP 2001119303    A   20010418  200219
US 6518690      B2   20030211  US 2001837546    A   20010418  200314
US 20030033700  A1   20030220  US 2001837546    A   20010418  200316
                               US 2002236754    A   20020906
US 6703257      B2   20040309  US 2001837546    A   20010418  200418
                               US 2002236754    A   20020906
Priority Applications (No Type Date): JP 2000118030 A 20000419
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Patent Details:
Patent No  Kind Lan Pg   Main IPC     Filing Notes
EP 1148561    A2 E  28 H01L-041/09
   Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT
   LI LT LU LV MC MK NL PT RO SE SI TR
US 20020014816 A1        H01L-041/04
JP 2002009359 A     14 H01L-041/09
US 6518690    B2       H01L-041/187
US 20030033700 A1        H04R-017/00   Div ex application US 2001837546
US 6703257    B2       H01L-021/00   Div ex application US 2001837546
Abstract (Basic): EP 1148561 A2
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NOVELTY - An integrated **piezo**electric /electrostrictive film type element has a substrate made of a ceramic material composed of zirconium oxide, and a **piezo**electric /electrostrictive operating section. The operating section is integrated to the substrate by a film-forming method. The heterophase-occurrence rate at a surface of the **piezo**electric /electrostrictive layer is controlled to 0.1-30%.

DETAILED DESCRIPTION - An integrated **piezo**electric /electrostrictive film type element includes a substrate made of a ceramic material composed mainly of completely or partially stabilized zirconium oxide, and a **piezo**electric /electrostrictive operating section (5). The operating section is integrated into the ceramic substrate by a film-forming method. The **piezo**electric /electrostrictive operating section includes a lower electrode, a **piezo**electric /electrostrictive layer (3) of lead-containing composition, and an upper electrode. The heterophase-occurrence rate at a surface of the **piezo**electric /electrostrictive layer is controlled to 0.1-30%.

An INDEPENDENT CLAIM is also included for a process for producing an **piezo**electric /electrostrictive film type element involving preparing a substrate material, and successively forming on the substrate a lower electrode, a **piezo**electric /electrostrictive layer of lead-containing composition, and an upper electrode by film-forming method. At least the **piezo**electric /electrostrictive layer is fired. A produced rate of a heterophase occurring at a surface of the **piezo**electric /electrostrictive layer is controlled to 0.1-30% in terms of an area rate by adjusting the concentration of lead in the firing atmosphere and/or the amount and speed of a running fluid of the firing atmosphere.

USE - The element is used as **transducer** , actuators, **filters** , display devices, transformers, **loudspeakers** , **microphones** , communication and power vibrators, resonators and transmitters, magnetic head-locating elements (hard discs, optical shutters, discriminators), sensors (ultrasonic wave sensors, accelerator sensors, angular velocity sensors, impact sensors, mass sensors and gyroscopes), servo displacement elements, pulse driven motors, ultrasonic motors, **piezo**electric fans, **piezo**electric relays, and film condenser element.

ADVANTAGE - The element has excellent durability without degradation in the substrate material, lowering of **piezo**electric /electrostrictive performance, or deterioration of **piezo**electric /electrostrictive layer characteristics even when used under high-temperature and highly humid atmosphere.

DESCRIPTION OF DRAWING(S) - The figure shows a partially cut-away, perspective view of a **piezo**electric /electrostrictive film type element having a cavity structure.

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        Piezoelectric /electrostrictive layer (3)
        Piezoelectric /electrostrictive operating section (5)
       pp; 28 DwgNo 1b/16
Derwent Class: L03; V06
International Patent Class (Main): H01L-021/00; H01L-041/04; H01L-041/09;
  H01L-041/187;  H04R-017/00
International Patent Class (Additional): G01L-001/16; H01L-041/22;
  H01L-041/24; H05K-003/02
Technology Focus:
...        Preferred Configuration: The ceramic substrate is  shaped  in
    the form of a thin diaphragm portion. The  piezoelectric
    /electrostrictive operating section is integrally formed on an outer
    surface of the diaphragm portion...
...crystals constituting the ceramic substrate is 0.1-2.0 mum. The
    thickness of the  piezoelectric /electrostrictive layer is not more
    than 100 mum. The thickness of the  piezoelectric /electrostrictive
    operating section is not more than 150 mum. The thickness of the
    diaphragm portion...
...an evaporating source containing lead as a constituent element; (ii) an
    arranged location of a  piezoelectric /electrostrictive material in a
    firing furnace or a firing vessel; (iii) an opening degree of...

 20/7,K/4     (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
011357281     **Image available**
WPI Acc No: 1997-335188/199731
  Piezoelectric -electrostrictive film-type element - comprises overhang
  section which is in state of incomplete connection w.r.t partial region
  of diaphragm section located just under it
Patent Assignee: NGK INSULATORS LTD (NIGA  )
Inventor: KIMURA K; NANATAKI T; TAKAHASHI N; TAKEUCHI Y
Number of Countries: 006  Number of Patents: 008
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
EP 782203      A2  19970702  EP 96309505     A   19961224  199731  B
JP 9186372     A   19970715  JP 95342414     A   19951228  199738
US 5814920     A   19980929  US 96777953     A   19961223  199846
US 6088893     A   20000718  US 96777953     A   19961223  200037
                             US 9857398      A   19980409
EP 782203      B1  20001025  EP 96309505     A   19961224  200055
DE 69610758    E   20001130  DE 610758       A   19961224  200102
                             EP 96309505     A   19961224
US 6263552     B1  20010724  US 96777953     A   19961223  200146
                             US 9857398      A   19980409
                             US 2000567067   A   20000508
JP 3344888     B2  20021118  JP 95342414     A   19951228  200279
Priority Applications (No Type Date): JP 95342414 A 19951228
Cited Patents: No-SR.Pub
Patent Details:
Patent No  Kind Lan Pg   Main IPC     Filing Notes
EP 782203     A2 E  23 H01L-041/09
   Designated States (Regional): DE FR GB IT
JP 9186372    A     16 H01L-041/09
US 5814920    A        H01L-041/08
US 6088893    A        H01L-041/08   Div ex application US 96777953
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                                         Div ex patent US 5814920
EP 782203      B1 E     H01L-041/09
   Designated States (Regional): DE FR GB IT
DE 69610758    E        H01L-041/09   Based on patent EP 782203
US 6263552     B1       B23P-015/00   Div ex application US 96777953
                                      Div ex application US 9857398
                                      Div ex patent US 5814920
                                      Div ex patent US 6088893
JP 3344888     B2    16 H01L-041/09   Previous Publ. patent JP 9186372
Abstract (Basic): EP 782203 A
        The element comprises zirconia substrate (2) with baseplate (4),
    rectangular window (6), thin-walled diaphragm plate (8), diaphragm
    section (10), film- shaped  lower electrode (12),  piezoelectric  or
    electrostrictive layer (14), upper electrode (16),  piezoelectric  or
    electrostrictive operating section (18) and spinel junction-prohibiting
    particles (20). A thin zirconia green sheet containing alumina is used
    to form plate (8) by being pressed to a prepared zirconia green sheet,
    with section (10) being 3-15 micron thick.
        Electrode (12) is formed by e.g. screen printing, dipping etc. or
    by sputtering for example and is sintered to make an electrode not more
    than 5 micron thick. Using a thick-film forming technique it is
    possible to form a film of layer (14) on section (10) using a paste or
    slurry containing ceramic particles of 0.05 to 5 micron average
    diameter.
        USE/ADVANTAGE - For actuators,  filters , displays, transformers,
    microphones , sounding bodies such as speakers, vibrators, resonators,
    oscillators, discriminators, gyroscopes, acceleration sensors, shock
    sensors, servo displacement elements, pulse driving motors, ultrasonic
    motors. Has improved displacement characteristics.
        Dwg.1/6
Derwent Class: P56; V06
International Patent Class (Main): B23P-015/00; H01L-041/08; H01L-041/09
International Patent Class (Additional): H01L-041/22;  H04R-017/00

 20/7,K/8     (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
008791883     **Image available**
WPI Acc No: 1991-295898/199140
  Body-borne noise  microphone  for hearing aid - is produced as capsule
  with  piezoelectric  resonator and impedance converter
Patent Assignee: BOLLIER E (BOLL-I); MEISTER E (MEIS-I)
Inventor: BOLLIER E; MEISTER E
Number of Countries: 017  Number of Patents: 004
Patent Family:
Patent No     Kind   Date     Applicat No    Kind   Date      Week
WO 9114350     A   19910919                                  199140  B
JP 4507178     W   19921210   JP 91505479     A   19910311  199304
                              WO 91CH54       A   19910311
CH 681671      A5  19930430   CH 90784        A   19900312  199322
DE 4190521     C2  19940303   DE 4190521      A   19910311  199408
                              WO 91CH54       A   19910311
Priority Applications (No Type Date): CH 90784 A 19900312
Cited Patents: DE 3023155; US 2311416; US 4258229; US 4458344; US 4591668
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
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WO 9114350    A
   Designated States (National): BR CA DE JP US
   Designated States (Regional): AT BE CH DE DK ES FR GB GR IT LU NL SE
JP 4507178    W        H04R-001/00   Based on patent WO 9114350
DE 4190521    C2     8 H04R-001/46   Based on patent WO 9114350
CH 681671     A5       H04R-001/04
Abstract (Basic): WO 9114350 A
        The  microphone  responds to body borne noise. The unit has a cup
    shaped  housing (1) into which is set an insulating element (3) with an
    inset ring (4). Mounted on the ring is a plate (6) that has an
    integrated  piezoelectrical  resonator (7).
         The resonator is supported on the plate by profiled supports such
    that it is activated at points and responds to high frequency
    components. The resonator is coupled by a wire (8) to an impedance
    converter (9). The end is enclosed by a diaphragm.
         ADVANTAGE - Improved sound efficiency. (27pp Dwg.No.1/4
Abstract (Equivalent): DE 4190521 C
        The  microphone  responsive to body sound has a  microphone
    capsule (1) with a  membrane  (5) on the side of the body, acting as a
    plate (6) incorporating a  piezoelectric  resonator. This plate is
    secured to the  microphone  capsule in a 3-point fixing with each of
    the fixing points lying at one corner of an equilateral triangle and
    associated with an angled slot in the surface of the plate.
        Pref., the plate is made of a bronze alloy, its centre of gravity
    coinciding with the centre of gravity of the  piezoelectric  resonator.
    The plate is pref. supported in an intermediate ring (4) and an
    insulation element (3).
        ADVANTAGE - Enhanced response for higher frequency tones.
        Dwg.1/4
Derwent Class: V06; W04
International Patent Class (Main): H04R-001/04; H04R-001/46
International Patent Class (Additional): H04R-001/20; H04R-009/08; H04R-017/02

 20/7,K/10     (Item 10 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
008029602     **Image available**
WPI Acc No: 1989-294714/198941
   Piezoelectric  capsule with lateral electrical connecting clamps - uses
  membrane  with projections extending from edge to allow electrical
  connection to be made outside cell by clamping
Patent Assignee: HORLOGERIE PHOTOGRAPH FSE (HORL-N); ORLOGER PHOTOGRAPHI
  (ORLO-N)
Inventor: COGNASSE C; GRAHAM P; MAURY B; WALTER J C
Number of Countries: 015  Number of Patents: 004
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
EP 336859      A   19891011  EP 89420115     A   19890330  198941  B
FR 2629660     A   19891006                                198947
JP 1292999     A   19891127  JP 8981319      A   19890331  199002
US 4947075     A   19900807  US 89327768     A   19890323  199034
Priority Applications (No Type Date): FR 884732 A 19880401
Cited Patents: FR 2507424; GB 2046554
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
EP 336859     A  F  10
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Designated States (Regional): AT BE CH DE ES FR GB GR IT LI LU NL SE
Abstract (Basic): EP 336859 A

The **piezo** -electric capsule comprises, in a hollow housing, a vibrating **membrane** (1) formed from a substrate (2) and two layers (3,4) of a **piezo**electric material having the external surfaces metallised to form electrodes (5,6).

The **membrane** has a radial projection (15) extending beyond its periphery, and the upper and lower faces of the **membrane** projection are gripped between the jaws of connectors (22,23) in the form of a clamp. The electrical connection thus requires no welding or soldering.

USE/ADVANTAGE - Avoids damage to **membrane** caused by welding of electrical contacts onto **membrane** in assembly of electro-acoustic **transducer**s , and facilitates sealing of **membrane** into its enclosure by avoiding need for passage for connecting electrical wires.

4/4

Abstract (Equivalent): US 4947075 A

The **piezo**electric insert comprises a **piezo**electric **membrane** with electrodes, held in position at its periphery by resilient seals providing sealing. The **membrane** comprises at least one off-centre zone projecting from the zone defined by the peripheral seal holding the **membrane** , the off-centred **membrane** portion defining a peripheral electric contact zone. The off-centred **membrane** portion, or radial excrescence, is housed inside the insert case in respective excrescences of the case portions.

Conducting surface elements, insulated from each other and in contact with their corresponding electrode, connect the corresponding electrode and the radial excrescence zone together. Resilient electric conductors are held in position in the insert case and each comprises an external tongue projecting from the case and forming a connection terminal of the insert, and an internal clip **shaped** portion, the external tongue and the internal portion being fast with each other and joined together by a portion passing through the wall of the case.

ADVANTAGE - Connection of electrodes requires no soldering. (9pp

Derwent Class: V06
International Patent Class (Additional): H01L-041/08; H04R-001/06; H04R-017/00

20/7,K/12 (Item 12 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
007451683 **Image available**
WPI Acc No: 1988-085617/198813

Loudspeaker with foil diaphragm - has grooves on opposite frame edges for series-connected piezoelectric elements to increase frequency range

Patent Assignee: SAMSUNG ELECTRO MEC (SAMS-N)
Inventor: LEE K S
Number of Countries: 002 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 3731132	A	19880324	DE 3731132	A	19870916	198813	B
US 4820952	A	19890411	US 8797628	A	19870916	198917	
DE 3731132	C	19890810				198932	

Priority Applications (No Type Date): KR 8615012 A 19860930; KR 8614341 A 19860916; KR 8614342 A 19860916
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 3731132	A		9		

US 4820952 A 9

Abstract (Basic): DE 3731132 A

The **loudspeaker** frame (1) has grooves (2) on opposite **edge**s to retain several **piezo**electric elements (3) in series. The diaphragm foil (5) contacts the top side of the **piezo**electric elements. The two opposite **edge**s of the diaphragm are passed through the frame and are tensioned by an **edge** cover (9).

The bottom sections of the grooves pref. comprise several recesses (4) such that the oscillation waves, generated in the lower region of the **piezo**electric elements, are radiated outwards. The diaphragm may be quadratic, with its left- and right-hand **edge** folded in a V- **shape** . The diaphragm may be dished.

ADVANTAGE - Better quality reproduction by increasing lower and middle range response, usually weakest in crystal type **loudspeaker**s .

2/10

The **membrane** (5) of a **piezo**electric **membrane** **loudspeaker** is rectangular ins hape with its sides clamped between front and rear parts (1,) of its rectangular frame and having a convex external surface.

Inwardly from the clamped **edge**s, the **membrane** is bent into a V- **shape** (6), the pointed ends (12) being in cotnact with the **piezo**electric elements (3). On the inside of the rear frame part (1) are recesses (2) containing the **piezo**electric elements. Behind the elements are holes (4) through the rear frame for radiation towards the rear, The **membrane** can be of transparent material. ADVANTAGE - Compact design with good quality sound reproduction.

(9pp

Abstract (Equivalent): US 4820952 A

A film **speaker** has a film diaphragm for transducing mechanical vibrations into sound waves and a number of **piezo** -electric elements for transducing electrical elements for transducing electrical signals into electrical vibrations. The **piezo** -electric elements are arranged in first and second grooves of a frame. The first and second **edge**s of the film diaphragm are held between end covers and the frame such that the film diaphragm is coupled to the **piezo** -electric elements. One portion of V- **shape**d cross section is coupled to one row of **piezo** -electric elements and another portion of V- **shape**d cross section being coupled to the other row of **piezo** -electric elements.

(9pp

Derwent Class: V06
International Patent Class (Additional): H01L-041/08; H04R-007/04; H04R-017/00

20/7,K/14 (Item 14 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
003381995
WPI Acc No: 1982-P0031E/198243

Omnidirectional **loudspeaker** tweeter unit - has **piezo**electric plate driving two opposed hemispherical **membrane**s

Patent Assignee: KLEIN S (KLEI-I)
Inventor: KLEIN S
Number of Countries: 012 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 63094	A	19821020				198243	B
FR 2503515	A	19821008				198246	

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JP 58040998     A    19830310                                 198316
US 4473721      A    19840925  US 82354165     A    19820303  198441
Priority Applications (No Type Date): FR 816511 A 19810401
Cited Patents: FR 1066926; US 2626380; US 2947821; US 3100291; US 3393764;
  US 3447217
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
EP 63094      A  G  19
   Designated States (Regional): AT BE CH DE GB IT LI NL SE
Abstract (Basic): EP 63094 A
        The  loudspeaker  unit has two hemispherical  membranes  (1,2)
    together forming a hollow sphere. The  membranes  are joined by an
    elastic ring (3) and are connected to the same drive (4) inside the
    sphere. The drive consists of a  piezoelectric  plate (7) with
    electrodes (8,9) on opposite faces and connected at opposite ends via
    two rigid transfer cups (5,6) to the two  membranes .
        Wires (10,11) are lead from the electrodes to terminals passing
    through the elastic ring that joins the  membranes . The drive may
    contain a  piezoelectric  device with a cross- shaped  cross-section or
    with tubular cross-section. The advantage lies in omnidirectionality,
    simple manufacture and smallness.
        1/7
Derwent Class: V06
International Patent Class (Additional): H04R-007/12; H04R-015/00;
  H04R-017/00 ; H04R-023/02

 20/7,K/16     (Item 16 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
001957176
WPI Acc No: 1978-J6449A/197844
  Sensitive accelerometer probe head - has  piezoelectric   transducer  on
  beryllium foil  membrane  attached to housing decoupled from vibrations
Patent Assignee: BRUEEL & KJAER AS (BRUE-N)
Inventor: BRUEL P V
Number of Countries: 005  Number of Patents: 006
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
DE 2815933     A    19781026                                197844  B
DK 7701708     A    19781113                                197849
FR 2388259     A    19781222                                197904
US 4189655     A    19800219                                198009
GB 1597212     A    19810903                                198136
DE 2815933     C    19830224                                198309
Priority Applications (No Type Date): DK 771708 A 19770419
Abstract (Basic): DE 2815933 A
        The probe head for an accelerometer has a cylindrical housing (1)
    with a ring- shaped  flange (2). On the under side of the flange is a
    rubber cushion seating (3). An externally-threaded ring (4) is mounted
    in a mating internal thread of the housing. The ring (4) carries a
    beryllium foil  membrane  (5) to which a  piezoelectric  ceramic disc
    (6) is stuck.
        A segment of a steel ball (7) is attached to the other surface of
    the disc. The disc is provided with connections for an amplifier (9).
    The probe head is mounted so that the steel ball segment (7) is in
    contact with a surface under investigation (15) and provides a
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sensitive measuring device with a compact construction
Derwent Class: S02; U12; V06
International Patent Class (Additional): G01H-001/00; G01L-000/00; G01P-015/08; H01L-041/10; H04R-017/00

20/7,K/17 (Item 17 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
001446841
WPI Acc No: 1976-A9728X/197605
Piezoceramic sound **transducer** system - has **piezo**ceramic plate joined to stiff **membrane** as driving element
Patent Assignee: STRIEGEL A (STRI-I)
Number of Countries: 001 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2433549	A	19760122				197605	B
DE 2433549	B	19771013				197744	

Priority Applications (No Type Date): DE 2433549 A 19740712
Abstract (Basic): DE 2433549 A

One electrod on the p.c. plate has a lead, and the other is connected to it by gluing to the diaphragm, to which the second lead is connected. The p.c. plate is firmly joined to the diaphragm by its centre, and the diaphragm's other side is joined by its centre to a mushroom- **shape**d acoustic support. This oscillating system, consisting of the above three components, is inserted in a case or a chassis. A flat or slightly conical metal or plastic diaphragm is provided at its rim with corrugations. The above acoustic support is made of metal, and its dia. is increased by a plastic ring.

Derwent Class: V06
International Patent Class (Additional): H04R-017/00

20/7,K/18 (Item 18 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
001303216
WPI Acc No: 1975-J7133W/197535
Piezoelectric electroacoustical transducer - has piezoelectric diaphragm of high polymer resin uniaxially oriented molecules
Patent Assignee: PIONEER ELECTRONIC CORP (PIOE)
Number of Countries: 003 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2506711	A	19750821				197535	B
US 3973150	A	19760803				197633	
GB 1504203	A	19780315				197811	

Priority Applications (No Type Date): JP 74U19527 U 19740218
Abstract (Basic): DE 2506711 A

The **piezo**electric diaphragm has large anisotropy in its plane, and has a rectangular **shape** and overlaps a rectangular plastics foam block. A clamping frame holds the diaphragm and the resultant vector of **piezo**electric constants lies in the diaphragm plane, parallel to its smaller axis. The clamping frame consists of at least two rigid parts opposite to each other and the direction in which the diaphragm has a highest **piezo**electric constant in its plane is parallel to its smaller axis. The rectangular clamping frame may clamp the **edge**s of the

membrane directly against a perforated rigid plate. The holes in the plate allow access of the sound waves to the plastics foam block.

Derwent Class: U12; V06
International Patent Class (Additional): H01L-041/04; H04R-017/00

20/7,K/19 (Item 19 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.
001303215
WPI Acc No: 1975-J7132W/197535

Piezoelectric electroacoustical **transducer** - has holder with two fastening elements opposite each other

Patent Assignee: PIONEER ELECTRONIC CORP (PIOE)
Number of Countries: 002 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2506710	A	19750821				197535	B
US 3997804	A	19761213				197652	
DE 2506710	C	19840712				198429	

Priority Applications (No Type Date): JP 74U19526 U 19740218
Abstract (Basic): DE 2506710 C

The diaphragm is of rectangular **shape** and is stretched between the two fastening elements in the lateral direction and is stretched between two fastening elements in the longitudinal direction and it is in contact with an elastic support. The support area is smaller than the diaphragm vibrating zone, so that a part of the diaphragm is not in contact with the support. The support consists of a suitable plastics foam, which forms a rectangular block when uncompressed. The **membrane** holds it down against a rigid plate with a large number of small perforations, this plate being spring loaded upwards against the plastics foam block.

DE 2506710 A

The diaphragm is of rectangular **shape** and is stretched between the two fastening elements in the lateral direction and is stretched between two fastening elements in the longitudinal direction and it is in contact with an elastic support. The support area is smaller than the diaphragm vibrating zone, so that a part of the diaphragm is not in contact with the support. The support consists of a suitable plastics foam, which forms a rectangular block when uncompresed. The **membrane** holds it down against a rigid plate with a large number of small perforations, this plate being spring loaded upwards against the plastics foam block.

Derwent Class: U12; V06
International Patent Class (Additional): H01L-041/04; H04R-017/00